NAVSHIPS 91,011-VOL. 2

INSTRUCTION BOOK

for

RADAR DF TARGET TRANSMITTER EQUIPMENT, NAVY MODEL OCY-1

2100 Mc. to 3800 Mc.

GENERAL COMMUNICATION CO.
BOSTON, MASS.

BUREAU OF SHIPS NAVY DEPARTMENT

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When this book was published, information was available only for volumes 1 and 2. Volumes covering units for other frequency ranges will be published at a later date.

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993-100

NAVY DEPARTMENT
BUREAU OF SHIPS
WASHINGTON 25, D.C.

3 February 1948

To: All Activities concerned with the Installation, Operation and Maintenance of the Subject Equipment.

Subj: Instruction Book for Radar DF Target Transmitter Equipment, Navy Model OCY-1, NAVSHIPS 91011 VOL. 2.

1. NAVSHIPS 91011 Vol. 2 is the instruction book for that portion of the subject equipment which covers the frequency range of 2100 Mc to 3800 Mc and is in effect upon receipt.

2. When superseded by a later edition, this publication shall be destroyed.

3. Extracts from this publication may be made to facilitate the preparation of other Navy Instruction Books and Handbooks.

4. All requests for NAVSHIPS electronics publications should be directed to the nearest District Publications and Printing Office. When revised books are distributed, notice will be included in the applicable maintenance bulletin and the Electron Magazine.

E. W. MILLS
Chief of Bureau

FROM BUREAU OF SHIPS

RECORD OF CORRECTIONS MADE

CHANGE NO.	DATE	SIGNATURE OF OFFICER MAKING CORRECTION

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GUARANTEE

The Contractor guarantees that at the time of delivery thereof the articles provided for under this contract will be free from any defects in material or workmanship and will conform to the requirements of this contract. Notice of any such defects or non-conformance shall be given by the Government to the Contractor within one year of the delivery of the defective or non-conforming article, unless a different period of Guaranty is specified in the schedule. If required by the Government, within a reasonable time after such notice, the Contractor shall with all possible speed correct or replace the defective or non-conforming article or part thereof. When such correction or replacement requires transportation of the article or part thereof, shipping costs, not exceeding usual charges, from the delivery point to the Contractor's plant and return, shall be borne by the Contractor; the Government shall bear all other shipping costs. This Guaranty shall then continue as to corrected or replacing articles, or replacing parts, until one year after the date of re-delivery, unless a different period of Guaranty is specified in the schedule. If the Government does not require correction or replacement of a defective or non-conforming article, the Contractor, if required by the contracting officer within a reasonable time after the notice of defect or non-conformance, shall repay such portion of the contract price of the article as is equitable in the circumstances.

INSTALLATION RECORD

Contract Number NObsr-30021 Date of Contract, 1 June 1946

Serial Number of equipment .....

Date of acceptance by the Navy .....

Date of delivery to contract destination .....

Date of completion of installation .....

Date placed in service .....

Blank spaces on this page shall be filled in at time of installation. Operating personnel shall also mark the "date placed in service" on the date of acceptance plate located below the model nameplate on the equipment, using suitable methods and care to avoid damaging the equipment.

REPORT OF FAILURE

Report of failure of any part of this equipment, during its entire service life, shall be made to the Bureau of Ships in accordance with current regulations using form NAVSHIPS NBS 383 (revised) except for Marine Corps equipment, in which case the "Signal Equipment Failure Report" form shall be used and distributed in accordance with instructions pertaining thereto. The report shall cover all details of the failure and give the date of installation of the equipment. For procedure in reporting failures see Chapter 67 of the *Bureau of Ships Manual* or superseding instructions.

ORDERING PARTS

All requests or requisitions for replacement material should include the following data:

1. Federal stock number or, when ordering from a Marine Corps or Signal Corps supply depot, the Signal Corps stock number.
2. Name and short description of part.

If the appropriate stock number is not available the following shall be specified:

1. Equipment model or type designation, circuit symbol, and item number.
2. Name of part and complete description.
3. Manufacturer's designation.
4. Contractor's drawing and part number.
5. JAN or Navy type number.

SAFETY NOTICE

The attention of officers and operating personnel is directed to Chapter 67 of the of *Bureau of Ships Manual* or superseding instructions on the subject of radio-safety precautions to be observed.

This equipment employs voltage which are dangerous and may be fatal if contacted by operating personnel. Extreme caution should be exercised when working with the equipment.

While every practicable safety precaution has been incorporated in this equipment, the following rules must be strictly observed:

KEEP AWAY FROM LIVE CIRCUITS:

Operating personnel must at all time observe all safety regulations. Do not change tubes or make adjustments inside equipment with high voltage supply on. Under certain conditions dangerous potentials may exist in circuits with power controls in the off position due to charges retained by capacitors. To avoid casualties always remove power and discharge and ground circuits prior to touching them.

DON'T SERVICE OR ADJUST ALONE:

Under no circumstances should any person reach within or enter the enclosure for the purpose of servicing or adjusting the equipment without the immediate presence or assistance of another person capable of rendering aid.

DON'T TAMPER WITH INTERLOCKS:

Do not depend upon door switches or interlocks for protection but always shut down motor generators or other power equipment. Under no circumstances should any access gate, door, or safety interlock switch be removed, short-circuited, or tampered with in any way, by other than authorized maintenance personnel, nor should reliance be placed upon the interlock switches for removing voltages from the equipment.

RESUSCITATION

AN APPROVED POSTER ILLUSTRATING THE RULES FOR RESUSCITATION BY THE PRONE PRESSURE METHOD SHALL BE PROMINENTLY DISPLAYED IN EACH RADIO, RADAR, OR SONAR ENCLOSURE. POSTERS MAY BE OBTAINED UPON REQUEST TO THE BUREAU OF MEDICINE AND SURGERY.

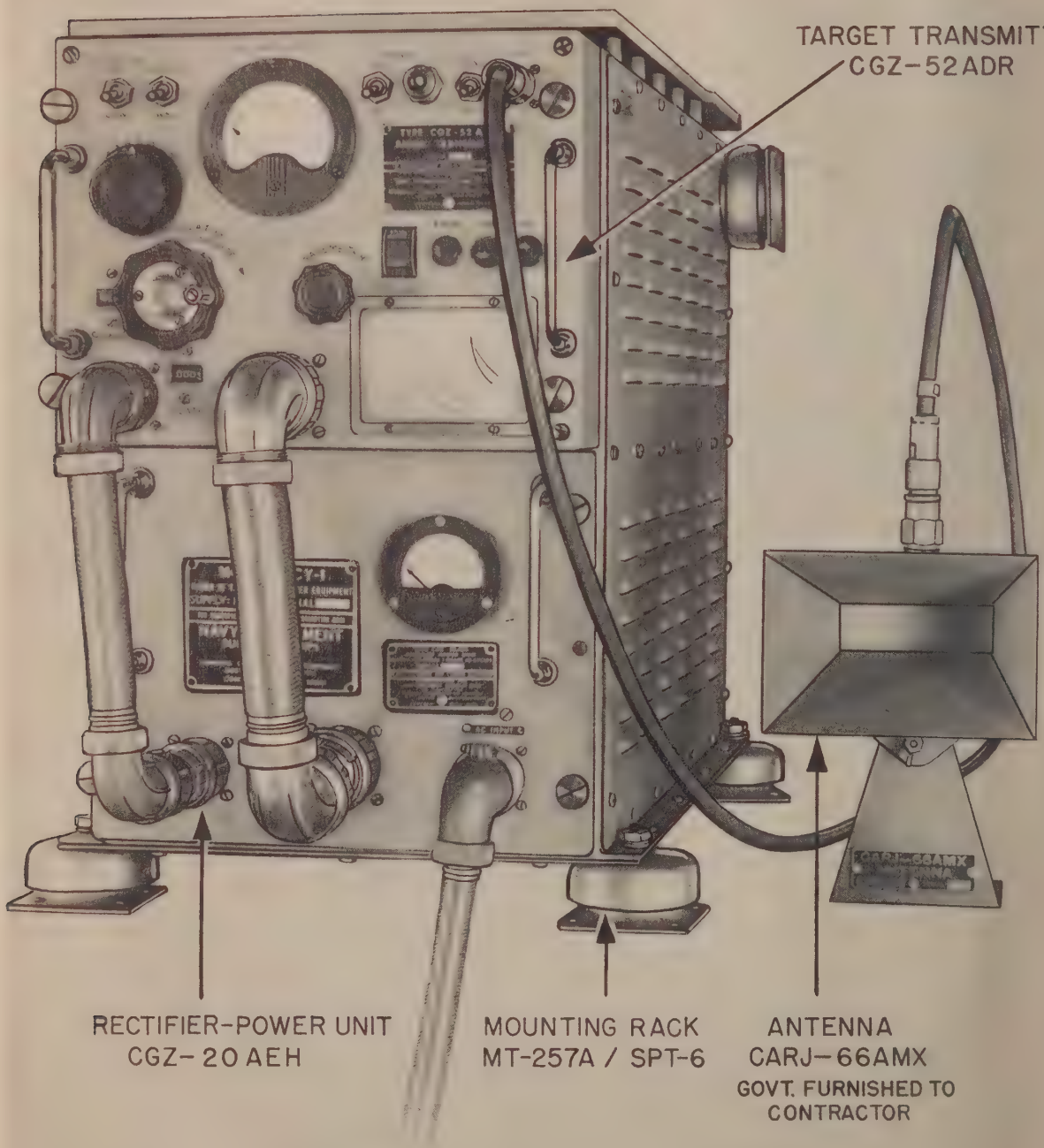


Figure 1-1. General View Radar Df Target Transmitter Equipment Navy Model OCY-1 (2100 Mc.-3800 Mc.)

SECTION 1
GENERAL DESCRIPTION

1. PURPOSE AND GENERAL DESCRIPTION.

a. Radar DF Target Transmitter Equipment, Navy Model OCY-1 is intended for use in calibrating Radar Direction Finder Equipment, Navy Model DBM-1 and similar direction finder equipments over the range of 80 Mc. to 3800 Mc. (Radar Transmitter AN/SPM-1 is intended for similar use over the frequency range of 3800 Mc. to 5000 Mc.)

b. The OCY-1 equipment includes Rectifier Power Unit CGZ-20AEH and four transmitter units capable of being used therewith (one at a time). These transmitter units and the frequency range covered by each are listed below:

NAME	NAVY TYPE	APPROX FREQUENCY RANGE
Radar Transmitter	-52ADW	80-160 Mc.
Radar Transmitter	CGZ-52ADN	165-1300 Mc.
Radar Transmitter	CGZ-52ADV	1300-2400 Mc.
Radar Transmitter	CGZ-52ADR	2100-3800 Mc.

c. The Rectifier-Power Unit, Navy Type CGZ-20AEH fits into the lower section of Mounting Rack MT-257A/SPT-6 and any one of the above radar transmitters can be accommodated in the upper section. Several antennas are used with the above radar transmitters to cover respectively the portions of the frequency range involved. (Radar Transmitter AN/SPM-1 is a separate equipment incorporating its own power supply and furnishing output similar to that of the OCY-1 equipment except for frequency range).

d. This volume of the OCY-1 instruction book applies to Radar Transmitter CGZ-52ADR and Rectifier-Power Unit, CGZ-20AEH. See figure 1-1, General View Radar DF Target Transmitter Equipment Navy Model OCY-1 (2100 Mc. —3800 Mc.). To simplify the discussion these units will be treated herein as a single complete equipment. This equipment operates from 115 volts A-C, 60 cycles at 1.6 amperes to furnish pulsed output at approximately 100 watts. The pulse duration is two to seven micro-seconds and the pulse rate is 540 or 590 p. p. s. over the frequency range of 2100 Mc. to 3800 Mc. in two modes.

2. GENERAL DESCRIPTION OF MAJOR UNITS.

a. PULSER MODULATOR. — CGZ-52ADR Pulser Modulator uses a JAN 2C43 oscillator tube which delivers 100 watts in the form of pulses of two to seven micro-seconds duration over the frequency range of 2100 Mc. to 3800 Mc. The pulser-modulator consists of a JAN 6L6 blocked oscillator driving a JAN 829B modulator tube. The R-F frequency of operation is measured with a wavemeter calibrated in frequency which is controlled by a dial located on the front panel.

b. RECTIFIER POWER UNIT. — The Rectifier Power unit, CGZ-20AEH, consists of three complete power supplies: a high voltage section using two JAN-1616 tubes providing a D-C output of approximately 1200 volts; a low voltage section using two JAN 5R4GY tubes providing a D-C output of approximately 500 volts; a 28 volt D-C blower motor supply utilizing a dry disc rectifier is included in the power pack, but is not used with the CGZ-52ADR.

c. ANTENNA. — The antenna used with this unit is the CARJ-66AMX. The Ship-borne antenna is a wide band slot antenna, utilizing a pyramidal horn which acts as a ground plane and increases directivity. The wide band characteristics of this antenna are particularly suitble for RCM requirements, and cover the range from 2200 to 3800 megacycles, with a maximum standing wave ratio of 2:1 over this frequency range. The antenna is mounted on either an AS-263/UPT or AS-236/SPT antenna pedestal, which permits rotation in the horizontal plane. A screw and wing nut connecting the flange mount and mounting bracket permits the antenna to be adjusted for horizontal, 45 degrees, and vertical polarization. The antenna can handle any power that can be safely carried by a RG-14/U cable.

3. REFERENCE DATA.

a. NOMENCLATURE.

(1) Over-all Equipment. — Radar DF Target Transmitter Equipment, Navy Model OCY-1.

(2) Radar Transmitter. — Type CGZ-52ADR Target Transmitter.

(3) Rectifier-Power Unit. — Type CGZ-20AEH.

(4) Antenna. — CARJ-66AMX.

(5) Mounting Rack. — MT-257A/SPT-6.

b. CONTRACT NUMBER. — NObsr-30021, dated 1 June 1946.

c. CONTRACTOR. — General Communication Co., 681 Beacon St., Boston 15, Mass.

d. COGNIZANT NAVAL INSPECTOR. — Inspector of Naval Material, Boston 10, Mass.

e. NUMBER OF PACKAGES PER COMPLETE SHIPMENT. —

f. TOTAL CUBICAL CONTENTS INCLUDING EQUIPMENT SPARES.

(1) Crated. — 8-3

(2) Uncrated. — 2-8

g. TOTAL WEIGHT INCLUDING EQUIPMENT SPARES.

(1) Crated. — 157

(2) Uncrated. — 81

h. FREQUENCY RANGE. — 2100 Mc. to 3800 Mc.

i. TUNING BANDS AND RANGE OF EACH. — 2100 Mc. to 3800 Mc. IN ONE BAND.

j. MODULATION. — Pulse, approximately two to seven micro-seconds.

k. OUTPUT POWER. — 100 watts.

l. FREQUENCY STABILITY. — 0.5%.

TABLE 1-1. EQUIPMENT SUPPLIED

QUANTITY PER EQUIPMENT	NAME OF UNIT	NAVY TYPE DESIGNATION	OVER-ALL DIMENSIONS	VOLUME	WEIGHT
1	CGZ-52ADR TARGET TRANSMITTER	CGZ-52ADR	26½ x 13¾, x 10½	2-2	65
1	EQUIPMENT SPARE BOX		18¼ x 9½ x 6¼	0-6	14
2	INSTRUCTION BOOKS	NAVSHIPS 91,011 Vol. 2			
1	ANTENNA	*CARJ-66AMX			2

Unless otherwise stated, dimensions are inches, volume cubic feet, weight pounds.
*Gov't supplied to Contractor.

TABLE 1-2. EQUIPMENT REQUIRED BUT NOT SUPPLIED

QUANTITY PER EQUIPMENT	NAME OF UNIT	NAVY TYPE DESIGNATION	REQUIRED USE	REQUIRED CHARACTERISTICS
1	MOUNTING RACK	MT-257A/SPT-6		
1	POWER SUPPLY	CGZ-20AEH	POWER RECTIFIER	

TABLE 1-3. SHIPPING DATA

SHIPPING BOX NO.	CONTENTS		OVER-ALL DIMENSIONS			VOLUME	WEIGHT
	NAME	DESIGNATION	HEIGHT	WIDTH	DEPTH		
1	CGZ-52ADR TARGET TRANSMITTER	CGZ-52ADR	30¾	16¼	17½	5-3	112
2	EQUIPMENT SPARE BOX		23	13	9	1-6	46
3	ANTENNA	CARJ-66AMX	16	13	13	1-6	15

Unless otherwise stated, dimensions are inches, volume cubic feet, weight pounds.

TABLE 1-4. VACUUM TUBE COMPLEMENT

UNIT	NUMBER OF TUBES OF TYPE INDICATED				
	JAN 2C43	JAN 6L6GT	JAN 829B	JAN 1616	JAN 5R4GY
CGZ-52ADR TARGET TRANSMITTER	1	1	1		
CGZ-20AEH POWER SUPPLY				2	2

SECTION 2
THEORY OF OPERATION

1. GENERAL.

The two units are composed of six major sections, *(See figures 2-1.)* and consist of the following:

a. OSCILLATOR CAVITY. — Employs a JAN 2C43 Lighthouse tube in a grounded grid circuit.

b. PULSER MODULATOR. — Employs one JAN 6L6G as a blocking oscillator, and one JAN 829B as a pulse amplifier.

c. ANTENNA POWER INDICATOR. — Consists of a 1N21B crystal, and a sensitive micro-ammeter.

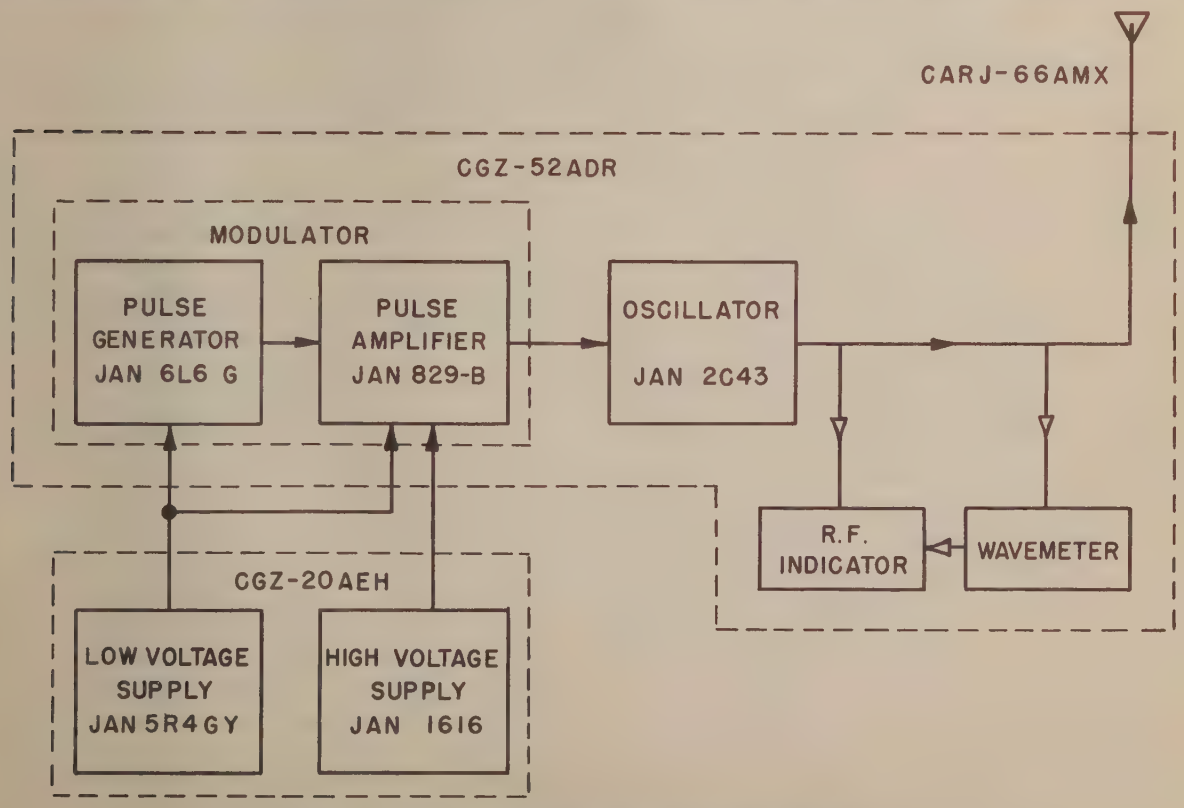


Figure 2-1. Radar Transmitter CGZ-52ADR and Rectifier Power Unit CGZ-20AEH Functional Block Diagram

d. WAVEMETER. — Has a frequency calibrated dial and utilizing a tunable quarter-wave stub inductively coupled to the oscillator cavity, a 1N21B crystal in conjunction with a sensitive meter serving as a wavemeter indicator device.

e. HIGH VOLTAGE POWER SUPPLY. — Uses a pair of JAN 1616 tubes.

f. LOW VOLTAGE POWER SUPPLY. — Uses a pair of JAN 5R4GY tubes.

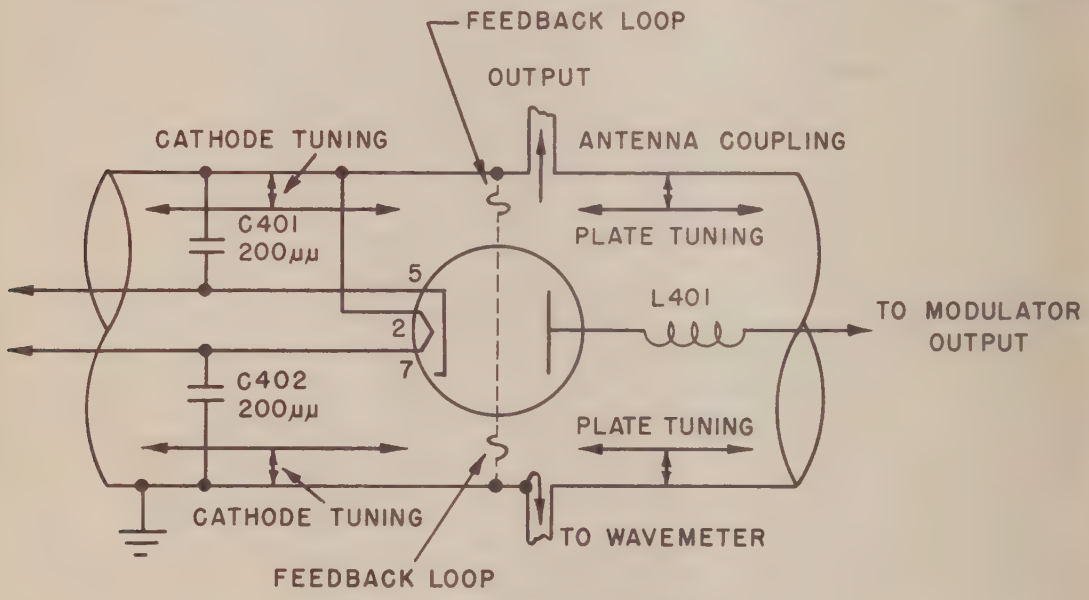


Figure 2-2. Oscillator Schematic

2. OSCILLATOR. *(See figure 2-2.)*

a. TYPE. — The type of oscillator employed in this equipment is known as a tuned-plate-tuned-grid. It is known that if the plate and grid circuits are tuned to the same frequency, and if some feedback between the two circuits prevails, the tube will maintain a state of oscillation, the frequency of which will be essentially dependent upon the resonant frequency of the grid and plate circuits. At low frequencies there is generally sufficient feedback within the tube itself so that no external coupling between the grid and plate is necessary. As higher frequencies are approached however, the effective Amplification Factor of the tube falls to such a low value that the internal feedback is insufficient, and therefore, the two circuits have to be coupled together in order to maintain oscillation.

b. GRID-PLATE TUNING CIRCUITS. — (See figure 2-2.) In the case of the CGZ-52ADR, the grid and plate tuning circuits are in the form of concentric lines. The resonant frequency of these lines may be changed by varying the length of the cavity with shorting fingers or pistons. If the two cavities are tuned to the same frequency, it will be found that moving both plungers in the same direction at the same speed will cause the frequency to change to a higher or lower value depending on the direction of plunger travel. In other words, the two plungers will tend to track. Perfect tracking is impossible in the case of this equipment, however, due to several factors the most important of which is antenna loading. It is therefore, necessary to make the two plungers move independently of each other when required. This is accomplished by a snap action on the tuning knob which allows both plungers to be moved simultaneously to the approximate setting, and then to peak by means of moving the Grid-Cathode plunger alone.

c. ANTENNA COUPLING. — Provision is made for coupling an antenna to the oscillator. This coupling is capacitive and may be varied by means of the ANTENNA COUPLING control on the front panel.

3. ANTENNA POWER INDICATOR. *(See figure 2-3.)*

The antenna power indicator consists of a 1N21B crystal (Y-401) inductively coupled to the antenna coupling probe. A small portion of the power in the transmission line is rectified by the crystal and indicated on the R.F. INDICATOR meter, M-201. The meter is used for both the antenna power indicator and the wavemeter indicator. A WAVEMETER-MONITOR switch is provided to connect the meter to the desired circuit. When used as the antenna power indicator, the switch SW-202 should be in the MONITOR position.

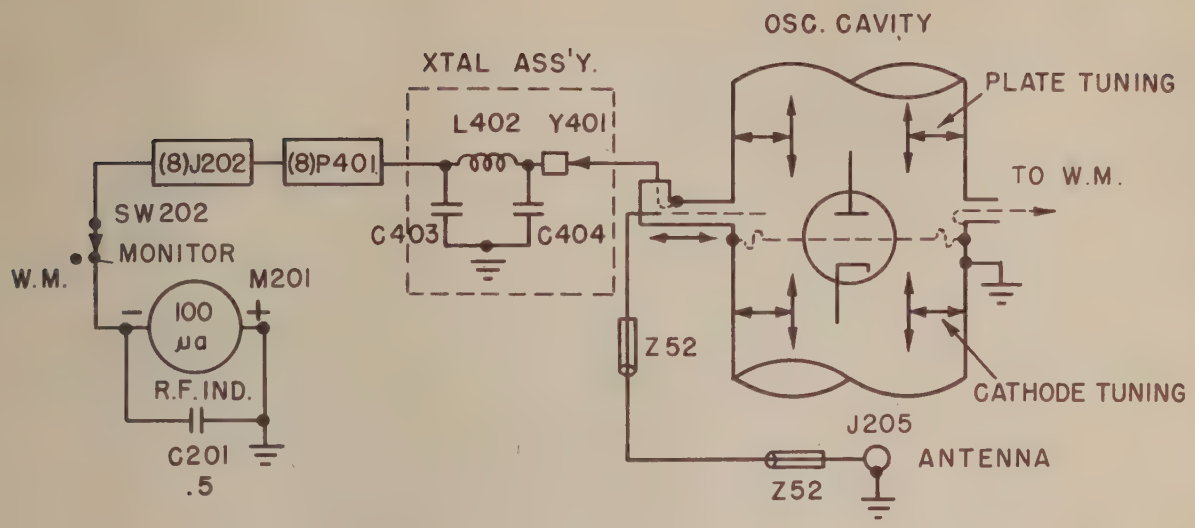


Figure 2-3. Antenna Power Indicator

4. WAVEMETER.

(See figure 2-4.)

The wavemeter consists of a concentric line with the length of the center stub variable. The wavemeter is loosely coupled, by means of a link, to the oscillator cavity. When the length of the stub is adjusted to one-quarter of the wavelength of the oscillator, it draws power. A portion of this power is rectified by the crystal, which is coupled to the wavemeter by a small loop. The frequency characteristics of the crystal rectifier are not flat, and therefore, the indication of resonance for different frequencies will vary widely, and should not be used as an indication of oscillator power.

5. PULSER-MODULATOR.

(See figure 7-23)

a. The pulser in the CGZ-52ADR consists of a J[illegible]6L6G (V-101) blocking oscillator, transformer

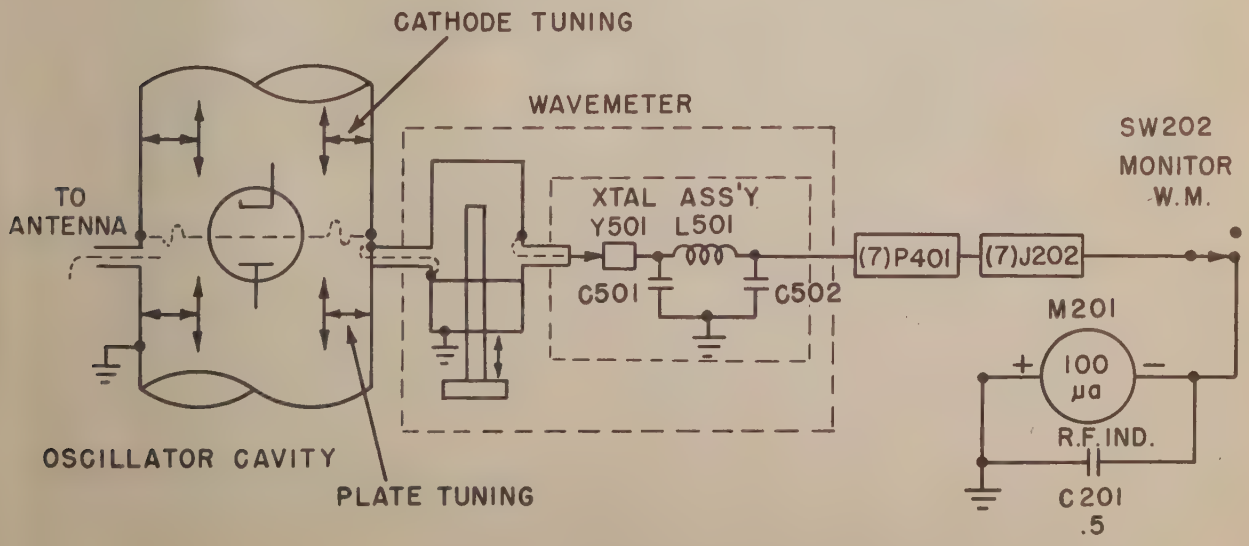


Figure 2-4. Wavemeter Schematic

coupled to twin paralled connected Beam Power JAN 829B (V-102) pulse amplifier tube. The grid and plates of the JAN 829B are tied together, and in turn transformer coupled to the JAN 2C43 (V-401) oscillator tube. The oscillator plate section of the modulation transformer T-102 has one end grounded, and the other end tied to the JAN 2C43 plate. This means that the only voltage that is available on the plate of the JAN 2C43 is that which is supplied in the form of pulses from the JAN 829B tube.

b. Tube JAN 6L6G (V-101) is used as a blocking oscillator. (See figure 7-24.) At a given instant, voltage is applied to R-104, and C-102 charges. At the same time current flows through R-104 from the screen of V-101, and from the plate of V-101 through the winding of T-101. For the moment let us consider only the windings of T-101 marked 1 and 2, and 5 and 6. Current flowing through T-101 from 1 and 2 induces a voltage across 5 and 6, such that 6 is positive with respect to 5. The grid of V-101 goes positive and draws electrons to it. Since the leakage path of these electrons is high and since an electron has a negative charge, they subsequently buck out the positive voltage from T-101 to the grid. At the same time, the load through R-104 is so high that the voltage across C-102 drops to a very low value. The combination of high bias on the grid and low voltage on the plate blocks the tube and it stops oscillating. The field collapses in T-101 since no current is now flowing through it, and a negative voltage appears at 6 which aids the negative charge already existing on the grid of V-101. The charge on the grid finally leaks off through the voltage divider, consisting of R-101, R-102, and R-103. C-102 charges and the operation repeats itself. This results in a condition where the oscillator is off most of the time and only produces a narrow pulse during one half of the cycle.

c. The circuit components of the blocking oscillator stage are such that approximately 540 p.p.s. are produced when the RECOGNITION switch is open, LOW position. When the RECOGNITION switch is in the HIGH position a portion of the resistance, R-101 plus R-102, is shorted out and the repetition rate rises to 590 p.p.s. In practice the RECOGNITION switch is placed to the HIGH position and R-102 is adjusted to give 590 p.p.s. The switch is then placed in the LOW position and R-102 is adjusted to produce 540 p.p.s. The length of the pulse will vary from approximately two to seven micro-seconds, and the shape of the pulse will not be rectangular. The odd pulse is considered advantageous since it makes the recognition of the CGZ-52ADR easier. Pulses produced across 3 and 4 of T-101 are transferred to the grid of JAN 829B (V-102), are amplified in V-102 and then coupled to the JAN 2C43 (V-401) oscillator via T-102.

6. HIGH VOLTAGE SUPPLY.

The high voltage supply uses a pair of JAN 1616 tubes in a conventional power supply circuit. (See figure 7-23.)

7. LOW VOLTAGE POWER SUPPLY.

The low voltage power supply uses a pair of JAN 5R4GY tubes in conventional power supply circuit. (See figure 7-23.)

8. BLOWER POWER SUPPLY.

The blower power supply consists of a copper-oxide dry disc rectifier in a conventional circuit. (See figure 7-23.) Its function is to supply 24 volts to the blower motor for the purpose of keeping the JAN 2C43 oscillator tube cool. This supply is *not* used in the CGZ-52ADR.

SECTION 3
INSTALLATION

1. GENERAL.

An outline dimensional drawing is shown in figure 3-1, Mounting Rack MT-275A/SPT-6 with Units Mounted in Place. The equipment is supplied complete with all inter-connecting cables, and installation of the equipment requires assembly of the antenna, (see Instruction book for CARJ-66AMX antenna), placement and securing of the major units, fabrication of the power cable and the coaxial antenna cable (See figure 3-2, Assembly of R-F Cable RG-8/U and Connector UG-21/U, and figure 3-3, Power Cable Connector), and adjustment for operation.

2. UNPACKING.

Use care in unpacking the equipment. Remove steel strapping and top of case. Remove screws on lower part of case on each side. Lift unit from box. After removing paper, it will be found that the unit is screwed to a wooden frame by means of its shock mounts. Remove these frames.

3. INSPECTION.

A careful visual inspection should be given the entire unit. The oscillator and power supply should be checked for broken parts and loose tubes. For method of removing units from rack, see Section 7, Corrective Maintenance.

4. BENCH TEST.

If desired, the equipment may be assembled and given a routine bench test before installation. The electrical connections in this case are the same as those for a normal installation. Unless a dummy load, presenting a non-inductive load of 50 ohms impedance, is available bench testing of the equipment will necessitate coupling to the antenna. For details see Section 4, Operation.

5. LOCATION OF EQUIPMENT.

The equipment is designed for table mounting. In general, the only requirements for location are that it be so placed as to provide for adequate circulation or air around the unit, particularly near the blower intake at the rear of the unit. Three inches all around the unit may be considered as satisfactory clearance. The equipment should be located so as to provide access to the panel controls and should not be more than 15 feet from the antenna. Use of a longer antenna transmission line is possible, but will result in a decrease in radiated power. If the transmitter is table or bench mounted it is recommended that the table top afford sufficient space to accommodate the modulator transmitter unit when removed from the rack for adjustment, tube replacement or other maintenance requirements.

6. INSTALLATION.

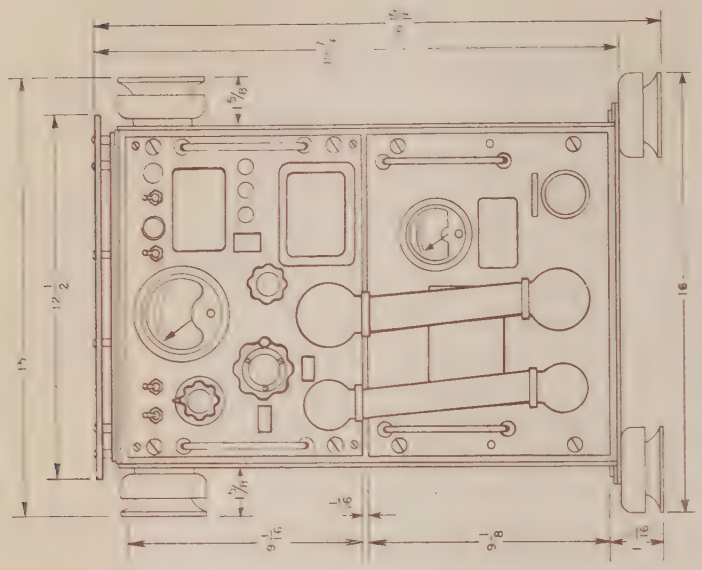
The procedure recommended for installation of the equipment is as follows:

a. TRANSMITTER. — The distance between the mounting holes and the transmitter shock mounts is indicated in figure 3-1, Mounting Rack MT-257A/SPT-6 With Units Mounted in Place. Drill holes in the table or bench top to accommodate the mounting bolts, and bolt the unit to the table. Side shock mounts are provided and may be used where the equipment is to be subjected to extreme tilting or vibration. Fabricate a power cable as shown in figure 3-3, Power Cable Connector, and connect the unit to a junction box or outlet providing 115 volt, 60 cycle, single phase, A-C power.

b. ANTENNA.

(1) GENERAL. — It should be kept in mind, when installing the antenna, that the radiation characteristic of the antenna is such that radiation is confined largely to a narrow beam 40 to 50 degrees wide. For this reason, the antenna support should be rotatable, and means should be provided for keeping the antenna trained on the target, necessitating control with reference to the relative bearing compass or gyro indicator. Since the equipment operates over line of sight distance, the antenna should be located at least 45 feet above the sea in LST's or large craft, and on small craft should be at least 15 feet above the sea. The dipole support tube should be horizontal. In the event this equipment is installed ashore, the antenna may be mounted on a tripod type pedestal (not furnished with this equipment) and the transmission line maintained as short as possible.

(2) ASSEMBLY. — For details on antenna see Instruction book for the CARJ-66AMX Antenna.



NOTES
1. ALL EXTERNAL CABLES ARE TO CONNECTORS ON FRONT PANELS
2. CLEARANCE REQUIRED FOR WITHDRAWAL OF TOP UNIT 23⅞ FROM FACE OF RACK
3. CLEARANCE REQUIRED FOR WITHDRAWAL OF BOTTOM UNIT 21 1/2 FROM FACE OF RACK
4. DIMENSIONS ARE IN INCHES

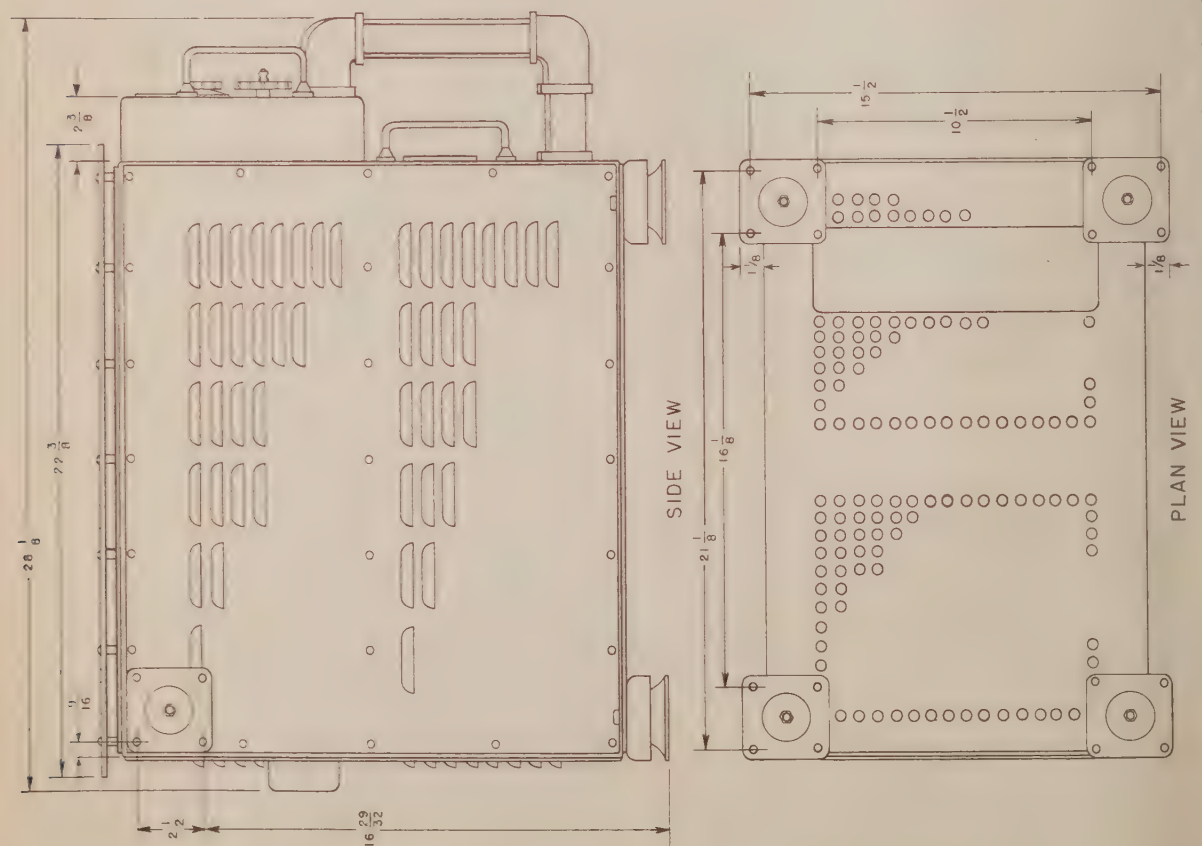


Figure 3-1. Mounting Rack MT-257A/SPT-6 with Units Mounted In Place

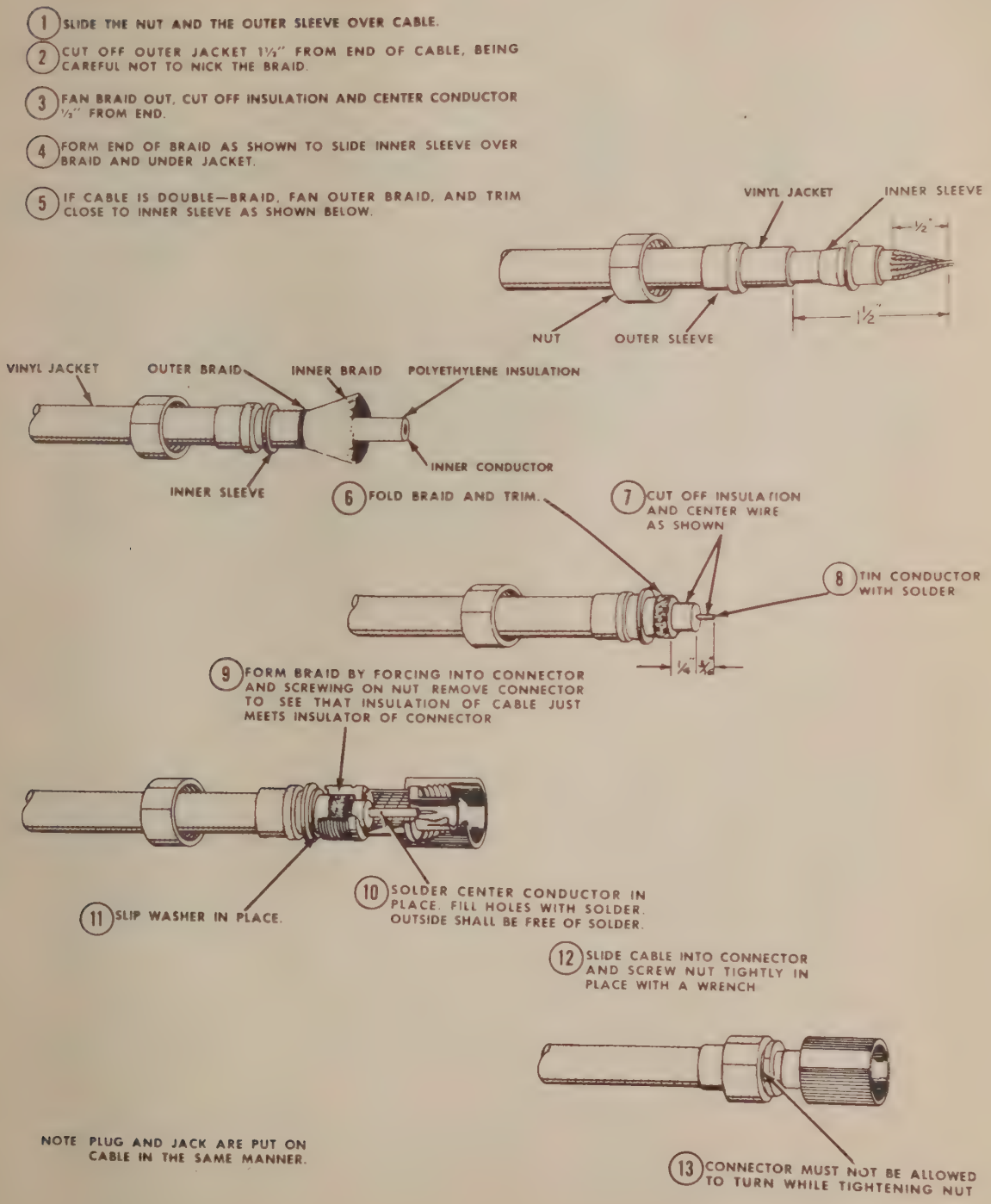

1 SLIDE THE NUT AND THE OUTER SLEEVE OVER CABLE.
2 CUT OFF OUTER JACKET 1⅛" FROM END OF CABLE, BEING CAREFUL NOT TO NICK THE BRAID.
3 FAN BRAID OUT, CUT OFF INSULATION AND CENTER CONDUCTOR ⅛" FROM END.
4 FORM END OF BRAID AS SHOWN TO SLIDE INNER SLEEVE OVER BRAID AND UNDER JACKET.
5 IF CABLE IS DOUBLE—BRAID, FAN OUTER BRAID, AND TRIM CLOSE TO INNER SLEEVE AS SHOWN BELOW.
VINYL JACKET
INNER SLEEVE
½"
1½"
NUT
OUTER SLEEVE
VINYL JACKET
OUTER BRAID
INNER BRAID
POLYETHYLENE INSULATION
INNER CONDUCTOR
INNER SLEEVE
6 FOLD BRAID AND TRIM.
7 CUT OFF INSULATION AND CENTER WIRE AS SHOWN
8 TIN CONDUCTOR WITH SOLDER
9 FORM BRAID BY FORCING INTO CONNECTOR AND SCREWING ON NUT. REMOVE CONNECTOR TO SEE THAT INSULATION OF CABLE JUST MEETS INSULATOR OF CONNECTOR
10 SOLDER CENTER CONDUCTOR IN PLACE. FILL HOLES WITH SOLDER. OUTSIDE SHALL BE FREE OF SOLDER.
11 SLIP WASHER IN PLACE.
12 SLIDE CABLE INTO CONNECTOR AND SCREW NUT TIGHTLY IN PLACE WITH A WRENCH
13 CONNECTOR MUST NOT BE ALLOWED TO TURN WHILE TIGHTENING NUT
NOTE PLUG AND JACK ARE PUT ON CABLE IN THE SAME MANNER.

Figure 3-2. Assembly of R-F Cable RG-8/U and Connector UB-21/U

(3) TRANSMISSION LINE. — The antenna transmission line, RG-8/U should not be more than 15 feet in length over-all. Less than 10 feet is preferred. The line should be so installed that no sharp bends (radius of less than six inches) are formed in the cable. The cable should be cleated to the mast, bulkheads, or other supports to keep it from whipping about, and out of the way of personnel.

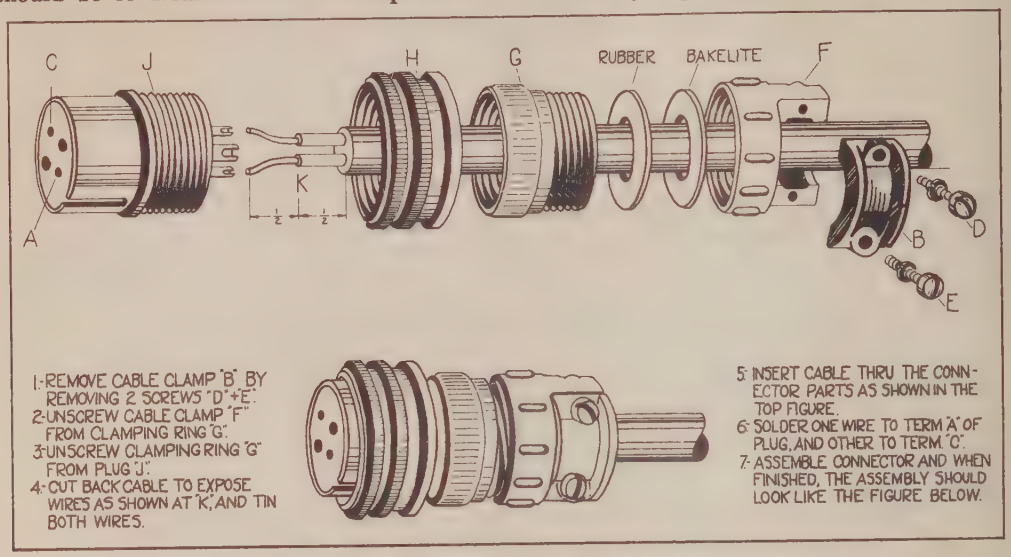

C
J
H
G
RUBBER
BAKELITE
F
A
K
½
½
B
D
E
1- REMOVE CABLE CLAMP "B" BY REMOVING 2 SCREWS "D" + "E".
2- UNSCREW CABLE CLAMP "F" FROM CLAMPING RING "G".
3- UNSCREW CLAMPING RING "G" FROM PLUG "J".
4- CUT BACK CABLE TO EXPOSE WIRES AS SHOWN AT "K", AND TIN BOTH WIRES.
5- INSERT CABLE THRU THE CONNECTOR PARTS AS SHOWN IN THE TOP FIGURE.
6- SOLDER ONE WIRE TO TERM "A" OF PLUG, AND OTHER TO TERM. "C".
7- ASSEMBLE CONNECTOR AND WHEN FINISHED, THE ASSEMBLY SHOULD LOOK LIKE THE FIGURE BELOW.

Figure 3-3. Power Cable Connector

ITEM	EQUIPMENT	REQ'D	NOMENCLATURE
1	Power Supply	1	CGZ-20AEH
2	Transmitter	1	CGZ-52ADR
3	Plug	1	AN-3108-28-19P
4	Ferrule	2	AN-3050-16
5	Shell	1	AN-3108-28
6	Plug	1	AN-3108-22-4S
7	Ferrule	2	AN-3050-12
8	Shell	1	AN-3108-22
*11	Plug	2	UG-21/U
*12	Antenna	1	CARJ-66AMX
13	Coupling Nut	2	AN-3054-16
14	Conduit	1	No. 9733-16
15	Coupling Nut	2	AN-3054-12
*16	Adapter	As Req'd	UG-27U
*17	Cable	1	RG-8/U
*18	Cable Clamp	1	AN-3057-12
*19	Cable	1	DCOP-6
*20	Plug	1	AN-3106-22-4S
21	Adapter	1	P-194-A257
22	Plug	1	AN-3106-28-19S
23	Adapter	1	P-194-A258
24	Plug	1	AN-3106-22-4P
25	Conduit	1	No. 9733-12

REFERENCE SPECIFICAT'N	WIRE NO.	MAX. OPERAT'G VOLTAGE	WIRE SIZE
JAN-C-76	a	115 AC	SRIR-4-(19)-14
JAN-C-76	c	115 AC	SRIR-4-(19)-14
JAN-C-76	A	115 AC	SRIR-1-(7)-20
JAN-C-76	B	GROUND	SRIR-1-(7)-20
JAN-C-76	C	GROUND	SRIR-1-(7)-20
JAN-C-76	E	115 AC	SRIR-1-(7)-20
JAN-C-76	G	115 AC	SRIR-4-(19)-14
JAN-C-76	H	550 DC	SRIR-1-(7)-20
JAN-C-76	J	115 AC	SRIR-1-(7)-20
JAN-C-76	K	0	SRIR-1-(7)-20
JAN-C-76	L	1	SRIR-1-(7)-20
JAN-C-76	M	1250 DC	SRIR-1-(7)-20
JAN-C-76	A'	115 AC	SRIR-6-(19)-12
JAN-C-76	C'	115 AC	SRIR-6-(19)-12

*GOV'T. FURNISHED TO CONTRACTOR.

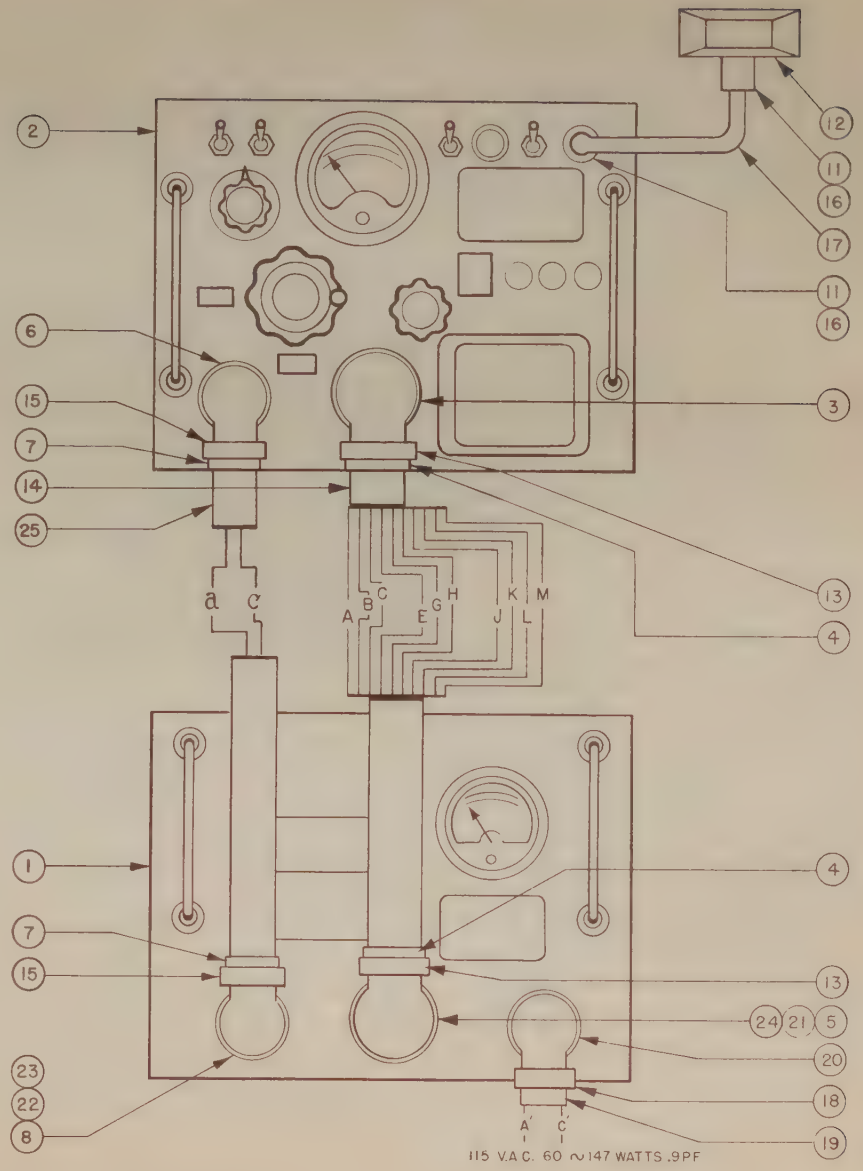


Figure 3-4. Cording Diagram

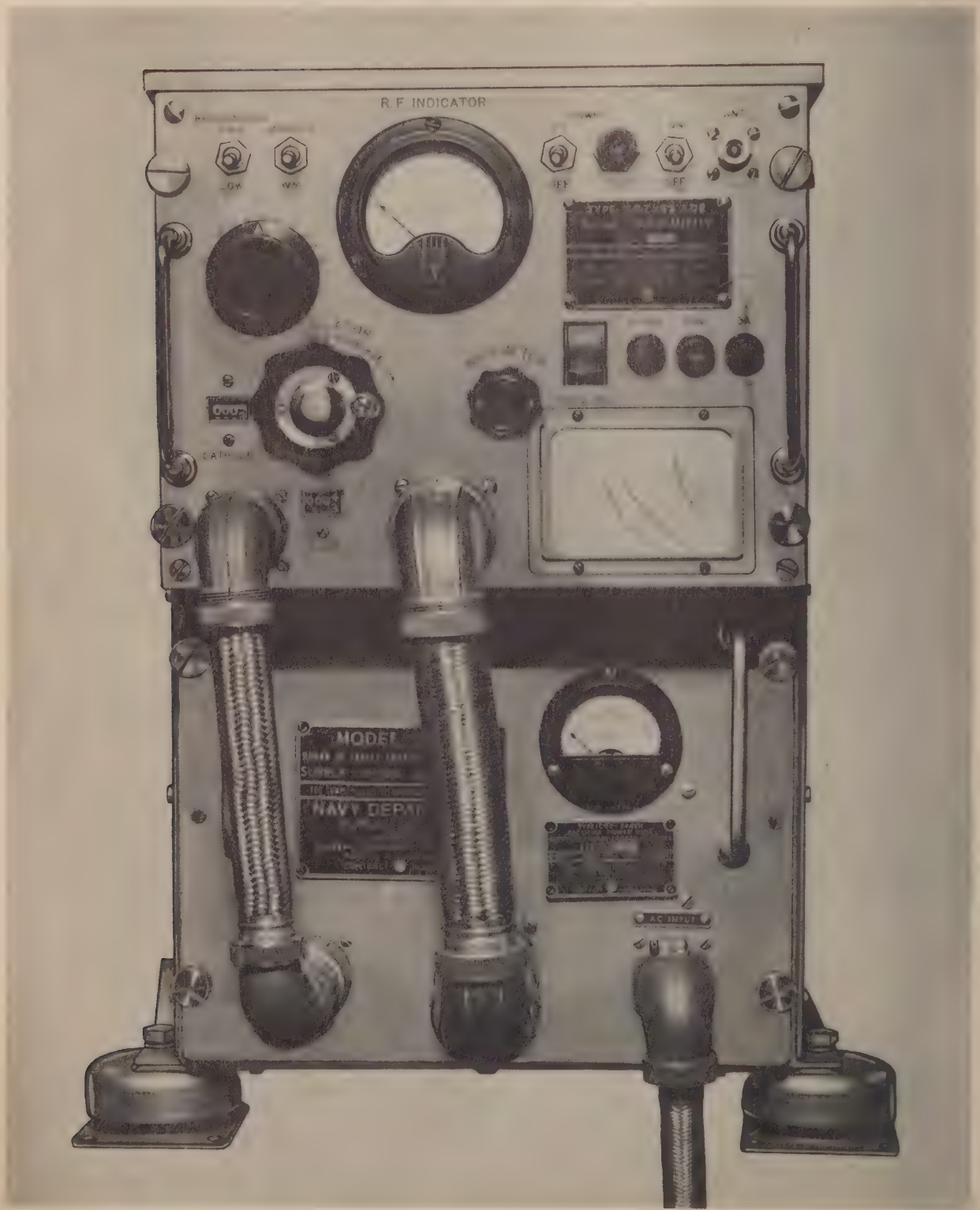


Figure 4-1. Front View CGZ-52ADR Target Transmitter and CGZ-20AEH Rectifier-Power Supply

SECTION 4
OPERATION

1. GENERAL.

a. The CGZ-52ADR Radar Transmitter which is contained in the upper section of the Mounting Rack MT-257A/SPT-6 is essentially a R-F oscillator that sends out pulses of a very short duration at a rate of either 590 or 540 p.p.s. as required by the operator. The frequency range of the oscillator is covered in one range without the necessity of changing frequency adapters. Two modes of operation are used as indicated on the plate and cathode counter chart, which is located on the lower right hand corner of the CGZ-52ADR panel, and in figure 4-2, Frequency Curves of this instruction book.

b. The lower unit, Rectifier-Power unit CGZ-20AEH consists of a high voltage section, a low voltage section, and a dry disc rectifier supplying D-C voltage to run a blower motor.

Note

THE DRY DISC RECTIFIER BLOWER SUPPLY IS NOT USED IN THE CGZ-52ADR. IT IS INTENDED FOR USE WITH OTHER UNITS OPERATED FROM THIS POWER SUPPLY.

The front panel of the power supply contains a 0-1 milliammeter. This meter registers the total cathode current drawn by the JAN-2C43 oscillator tube. Its indication is of no particular value in the case of the unit covered by this instruction book. It is intended primarily for use with other units operated from this power supply.

c. When properly tuned the oscillator is capable of emitting a pulse signal of approximately 100 watts over the range of 2100 Mc. to 3800 Mc.

2. TO PLACE THE EQUIPMENT IN OPERATION.

Before starting the equipment refer to figure 4-1, Front View CGZ-52ADR Target Transmitter and CGZ-20AEH Rectifier-Power Supply. Place controls in the following positions:

a. POWER switch OFF position.

b. MOD switch OFF position.

c. MONITOR-W.M. switch to MONITOR position.

d. RECOGNITION switch in either position.

e. Set ANT. COUPLING control to 5.

f. Set WAVEMETER control to the desired frequency, as indicated on the wavemeter dial.

g. Place POWER switch to the ON position. Power *on* will be indicated by the red pilot light to the right of the power switch. Approximately five minutes should be allowed for the unit to warm up before throwing the MOD. switch.

h. Choose the Cathode and Plate counter settings for the desired frequency from figure 4-2, Frequency Curves. These curves are also located in a frame on the lower right hand corner of the CGZ-52ADR panel. The MAIN TUNING knob has two positions. It will be found that when the knob is pulled *out*, both the cathode and plate tuning plungers register. When the knob is pressed *in*, only the cathode plunger and cathode counter are actuated, thus making it possible to peak the cathode to a given plate setting. From the above mentioned curves, set the cathode and plate counters to the proper value.

i. Place the MOD. switch to the ON position. Current should show on the R.F. INDICATOR meter. Press the MAIN TUNING knob *in* and rotate forward or backward until maximum current is shown on the R.F. INDICATOR. (This is known as peaking the cathode).

j. Rock the ANTENNA COUPLING control back and forth until maximum current is shown on the R.F. INDICATOR.

k. Place the MONITOR-W.M. switch to the W.M. position. If the oscillator is tuned to the same frequency as the wavemeter, current will show on the R.F. INDICATOR. This is usually not the case, since the curves in Figure 4-2, Frequency Curves, are only approximate.

l. Rotate the oscillator MAIN TUNING knob, in the *out* position, backward or forward until indication is shown on the R.F. INDICATOR. With the oscillator MAIN TUNING control in the *out* position, carefully set the R.F. INDICATOR for maximum reading.

Note

IT SHOULD BE UNDERSTOOD THAT THE R.F. INDICATOR IS ONLY A PEAKING DEVICE. THE METER MAY NOT GIVE THE SAME READING IN BOTH THE W.M. AND MONITOR POSITIONS.

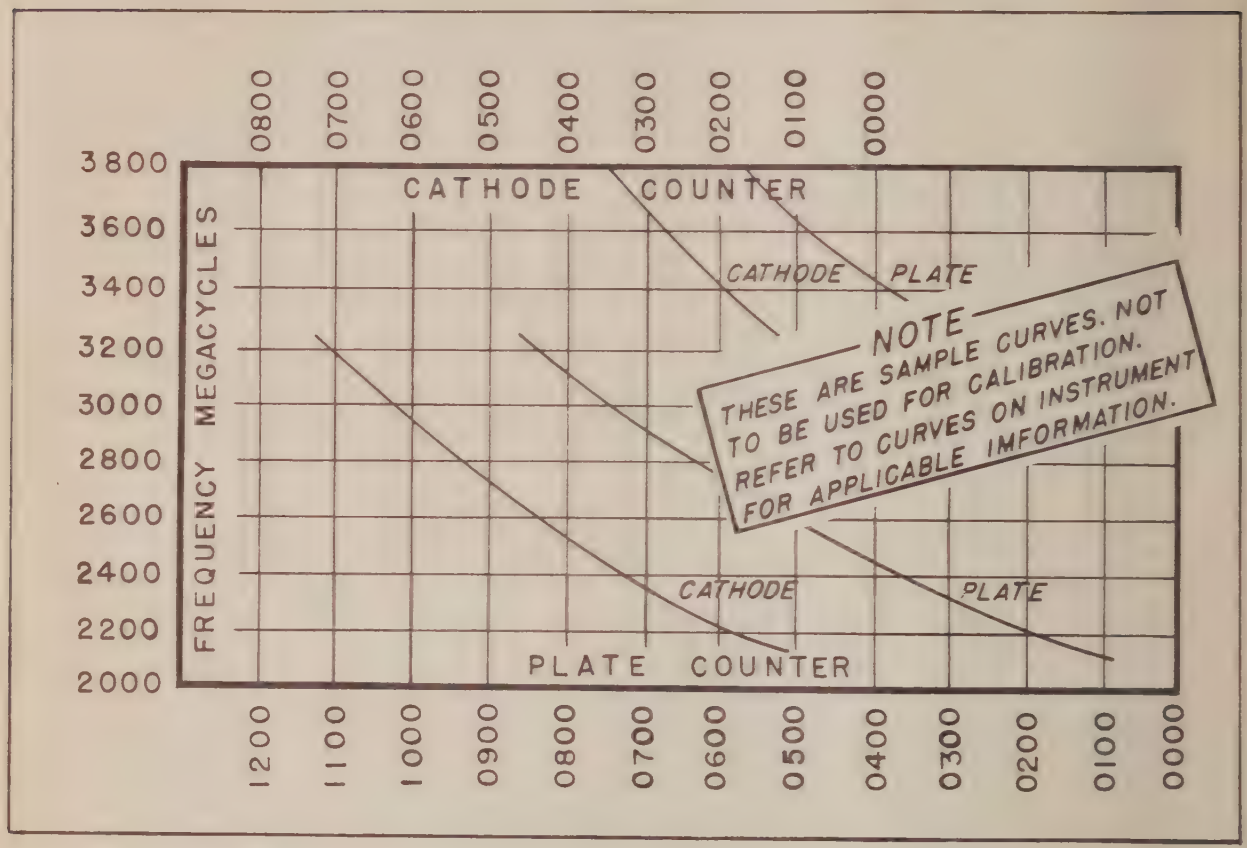


Figure 4-2. Frequency Curves

m. Snap MONITOR-W.M. switch to MONITOR position. Re-peak ANTENNA COUPLING control for maximum R.F. INDICATOR current.

n. Place oscillator MAIN TUNING knob *in* and re-peak R.F. INDICATOR.

o. Place MONITOR-W.M. switch to W.M. position. It may be found that the above adjustments have shifted the oscillator frequency slightly. Therefore, rock the oscillator control in the *out* position until maximum indication is obtained. The above routine should be repeated a sufficient number of times to insure that the oscillator is tuned as closely as possible to the wavemeter.

p. Under ideal conditions, the MONITOR-W.M. switch may be placed to either position, and adjustment of the ANTENNA COUPLING knob or the Plate or Cathode tuning controls will produce no increase in output.

Note

PROPER SETTING OF THE CATHODE WITH RELATION TO THE PLATE IS IMPORTANT. IT WILL BE FOUND THAT THE TRANSMITTER WILL FUNCTION AT SEVERAL DIFFERENT CATHODE POSITIONS FOR THE SAME PLATE POSITION. ONLY THE POSITIONS INDICATED IN FIGURE 4-2, FREQUENCY CURVES SHOULD BE USED. ANY OTHER SETTING MAY PRODUCE A SPURIOUS MODE, DIFFERING GREATLY IN FREQUENCY FROM THE DESIRED ONE. THESE SPURIOUS MODES MAY HAVE CONSIDERABLE STRENGTH WHICH CAN CAUSE INTERFERENCE WITH OTHER EQUIPMENTS IN THE VICINITY. TUNE CAREFULLY

3. RECOGNITION HIGH AND LOW.

At times it may be difficult to recognize the CGZ-52ADR in the receiver due to interference from other radar systems. Two repetition rates are provided and the most satisfactory one should be used. When the RECOGNITION switch is in the HIGH position, the PRF is approximately 590 p.p.s., and when in the LOW position approximately 540 p.p.s. It should also be understood that the pulse waveform of the CGZ-52ADR is not necessarily rectangular. This is intentional, and is done to make it possible to recognize the CGZ-52ADR by means of its pulse shape.

4. STANDBY POSITION.

When it is desired to place the equipment inoperative for a short period of time, place the MOD. switch to the OFF position. This allows the heaters to remain energized so that the equipment may be placed back in operation without warming up.

5. STOPPING THE EQUIPMENT.

To stop the equipment place the POWER switch in the OFF position.

SECTION 5
OPERATOR'S MAINTENANCE

1. MAINTENANCE TEST SCHEDULE.

The following inspection or test procedure will insure satisfactory operation of the equipment:

a. BEFORE EACH WATCH. — Tune the unit as indicated in Section 4, Paragraph 2. The use of a high frequency of approximately 3600 Mc. is recommended, as the higher frequencies are a better over-all check.

b. HOURLY. — At hourly intervals with the equipment in continuous operation, check for peak R-F Indication on both MONITOR and W.M. positions of the MONITOR-W.M. switch. The meter on the power supply panel, M-301, should normally read between and when the oscillator is peaked.

2. TROUBLE LOCATION.

a. The following possible sources of trouble should be checked in event that the equipment becomes entirely, or partially inoperative:

(1) All cable connections.

(2) Line voltage.

(3) Improper tuning of the CGZ-52ADR, especially the ANTENNA COUPLING control.

(4) Blown fuses.

CAUTION

Never replace a fuse with one of higher rating unless continued operation of the equipment is more important than probable damage. If a fuse burns out immediately after replacement, do not replace a second time. DO NOT CHANGE ANY TUBES unless proper authority is given.

b. If the difficulty is of a more complicated nature than the above described, it is advised that the unit be serviced by a technician as outlined in Section 7.

3. ANTENNA FAILURE.

a. If antenna fails to operate, the trouble will generally be found to be:

(1) Damaged or corroded connectors.

(2) Improper assembly of connectors.

(3) Damaged cable.

(4) Excessive length of RG-8/U cable resulting in too much line loss.

Note

THE ATTENTION OF MAINTENANCE PERSONNEL IS INVITED TO THE REQUIREMENTS OF CHAPTER 67 OF THE *BUREAU OF SHIPS MANUAL* OF THE LATEST ISSUE.

SECTION 6
PREVENTIVE MAINTENANCE

1. INSPECTION.

To maintain the equipment at the peak of efficiency and to guard against breakdown, the following routine of inspection is recommended.

a. WEEKLY. — At weekly intervals the inspection should include, in addition to the procedure outlined in paragraph 1b of Section 5, the following:

(1) Clean the case and panel thoroughly. Avoid solvents which might have a deleterious effect upon fungus protection, insulation, shock mounts, etc.

(2) See that the oscillator-modulator and rectifier-power units are firmly secured in the case.

(3) Check mounting bolts, cable clamps, and the antenna installation for mechanical faults.

b. QUARTERLY. — After approximately 400 hours of operation, or at quarterly intervals, the inspection procedure should include testing of all tubes in the oscillator-modulator and rectifier-power assemblies. A log should be maintained on the tube characteristics (plate and grid currents drawn), and any tubes showing a falling off in electron emission should be replaced.

c. SEMI-ANNUAL. — In addition to the checks outlined in paragraphs 1a and 1b preceding, at the time of the semi-annual check the following should be included:

(1) The unit should be removed from the case, both assemblies should be thoroughly checked for mechanical faults, loose connections, loose transformers, capacitors or structural assemblies, broken or cracked insulators, and for charred or deteriorated insulation. Replace any obviously doubtful or defective components.

(2) Check all interconnecting cables carefully for insulation breaks or possible loosening of the cable connector clamps.

(3) Check the antenna for electrical and mechanical faults as follows:

(*a*) Connectors should be opened to check that no foreign matter has entered them and that corrosion has not taken place. Contacts should be tight and spaced correctly.

(*b*) The modified UG-101/U connector mounted in the side of the cavity should never be left open and exposed to the weather. When not connected to a cable connector it should be covered to protect it from moisture and dirt.

(*c*) The horn, rubber gasket, and fiberglass window should be removed and cavity checked to see that no moisture is present. Should moisture be present, dry the cavity, and replace the gasket with the spare gasket supplied.

(*d*) If fiberglass shows cracks or stain patterns, replace with spare supplied.

(*e*) If the rubber gasket has lost its resiliency, replace with the spare gasket supplied.

(*f*) Should the horn become bent or damaged in any way, replace with the spare horn supplied.

(*g*) Cable should be inspected for evidence of wear. If damaged or worn, it should be replaced.

(4) Apply a very thin film of Instrument Lubricating Oil, Bureau of Ordnance 14-0-20 (Ord) to the points marked X in figure 7-22, exploded view of Oscillator Cavity.

CAUTION

Extreme care must be taken in applying oil or grease on parts which enter or work in the oscillator cavity. The presence of any oil or grease on the cavity inner walls will greatly reduce the output and cause unstable action of the oscillator.

2. FEDERAL STANDARD STOCK CATALOG NUMBERS.

SPECIFICATION	1 PINT
14-0-20 (Ord)	14-0-975-25

FAILURE REPORTS

A FAILURE REPORT must be filled out for the failure of any part of the equipment whether caused by defective or worn parts, improper operation, or external influences. It should be made on Failure Report, form NBS-383, which has been designed to simplify this requirement. The card must be filled out and forwarded to BUSHIPS in the franked envelope which is provided. Full instructions are to be found on each card.

Use great care in filling the card out to make certain it carries adequate information. For example, under "Circuit Symbol" use the proper circuit identification taken from the schematic drawings, such as T-803, in the case of a transformer, or R-207, for a resistor. Do not substitute brevity for clarity. Use the back of the card to completely describe the cause of failure and attach an extra piece of paper if necessary.

The purpose of this report is to inform BUSHIPS of the cause and rate of failures. The information is used by the Bureau in the design of future equipment and in the maintenance of adequate supplies to keep the present equipment going. The cards you send in, together with those from hundreds of other ships, furnish a store of information permitting the Bureau to keep in touch with the performance of the equipment of your ship and all other ships of the Navy.

This report is not a requisition. You must request the replacement of parts through your Officer-in-Charge in the usual manner.

Make certain you have a supply of Failure Report cards and envelopes on board. They may be obtained from any Electronics Officer.

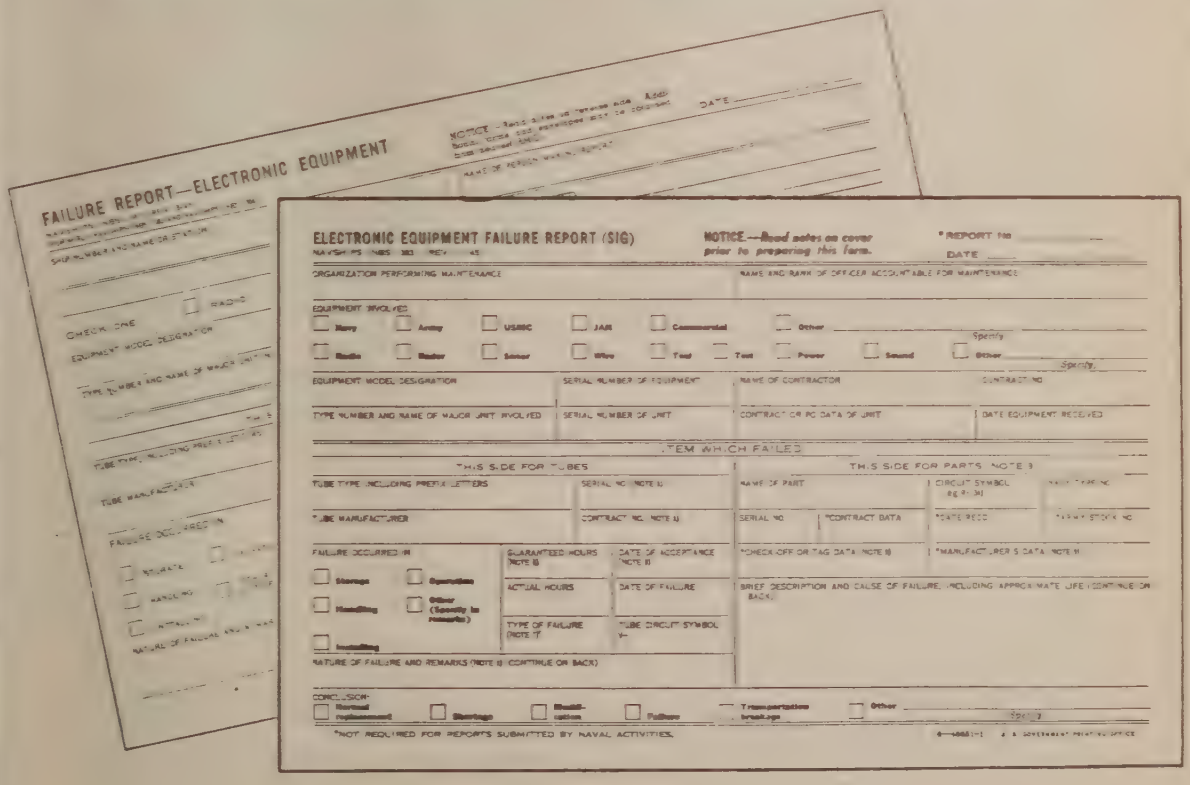

FAILURE REPORT—ELECTRONIC EQUIPMENT
ELECTRONIC EQUIPMENT FAILURE REPORT (SIG)
NOTICE.—Read notes on cover prior to preparing this form.
ORGANIZATION PERFORMING MAINTENANCE
NAME AND RANK OF OFFICER ACCOUNTABLE FOR MAINTENANCE
EQUIPMENT INVOLVED
EQUIPMENT MODEL DESIGNATION
SERIAL NUMBER OF EQUIPMENT
NAME OF CONTRACTOR
CONTRACT NO
TYPE NUMBER AND NAME OF MAJOR UNIT INVOLVED
SERIAL NUMBER OF UNIT
CONTRACT OR PO DATA OF UNIT
DATE EQUIPMENT RECEIVED
ITEM WHICH FAILED
THIS SIDE FOR TUBES
THIS SIDE FOR PARTS NOTE 3
TUBE TYPE INCLUDING PREFIX LETTERS
SERIAL NO NOTE 11
TUBE MANUFACTURER
CONTRACT NO NOTE 11
NAME OF PART
CIRCUIT SYMBOL REF DES
SERIAL NO
*CONTRACT DATA
*DATE RECD
*NAVY STOCK NO
FAILURE OCCURRED IN
GUARANTEED HOURS NOTE 10
DATE OF ACCEPTANCE NOTE 10
ACTUAL HOURS
DATE OF FAILURE
TYPE OF FAILURE NOTE 17
TUBE CIRCUIT SYMBOL
*CHECK-OFF OR TAG DATA NOTE 10
*MANUFACTURER'S DATA NOTE 14
BRIEF DESCRIPTION AND CAUSE OF FAILURE, INCLUDING APPROXIMATE LIFE (CONTINUE ON BACK)
NATURE OF FAILURE AND REMARKS (NOTE 8 CONTINUE ON BACK)
CONCLUSION
*NOT REQUIRED FOR REPORTS SUBMITTED BY NAVAL ACTIVITIES.

Figure 7-1. Failure Reports

SECTION 7
CORRECTIVE MAINTENANCE

1. GENERAL.

a. In general, failure or improper operation of Radar Transmitter, Navy Type CGZ-52ADR and Rectifier-Power Unit CGZ-20AEH can be reduced to five major causes.

(1) Lack of line voltage to energize the equipment.

(2) Defective fuses.

(3) Improper adjustment of controls.

(4) Component part breakdown; tubes, capacitors, resistors, etc.

(5) Loose or faulty connectors between unit parts.

b. Many of the apparent troubles with the CGZ-52ADR may be caused by improper adjustment of the various controls.

NOTE

BEFORE SERVICING, MAKE SURE THAT THE EQUIPMENT IS IN PROPER OPERATING ADJUSTMENT.

2. FUNCTIONS OF PANEL CONTROLS.

a. POWER OFF-ON SWITCH. — supplies voltage to:

(1) Primary of T-302, (See figure 7-23, Schematic Diagram).

(2) Filament voltages to V301-1 and V301-2.

(3) Filament voltages to V302-1 and V302-2.

(4) A-C voltage to Selenium rectifier.

(5) Line voltage to filament transformer in Modulator, T-103, which in turn supplies filament voltage to V-101 (6L6G), V-102 (829B), and V-401 (2C43), and voltage to the pilot light.

b. MODULATOR OFF-ON SWITCH. — Is in series with the POWER OFF-ON switch and supplies:

(1) Line voltage to the primary of T-301 in the Power Supply CGZ-20AEH, which in turn supplies plate voltage to V-102 (829B).

(2) Line voltage to the primary of T-303 of the Power Supply CGZ-20AEH, which in turn supplies plate and screen voltages to V-101 (6L6) and screen voltage to V-102 (829B).

c. RECOGNITION HIGH-LOW SWITCH.

(1) In the HIGH position components in the 6L6 (V-101) blocked oscillator circuit are switched to a value that produces 590 p.p.s.

(2) In the LOW position components in the 6L6 (V-101) blocked oscillator circuit are switched to a value that produces 540 p.p.s.

d. MONITOR-W.M. SWITCH. — With the switch in the MONITOR position the R.F. INDICATOR meter, M-201, is placed in series with the antenna power indicator crystal. With the switch in the W.M. position the R.F. INDICATOR is placed in series with the wavemeter crystal.

e. ANTENNA COUPLING CONTROL. — This controls the probe which couples the CARJ-66AMX antenna to the oscillator, making it possible to adjust the coupling to a point giving maximum power transfer from the oscillator to the antenna, the indication of which is shown on the R.F. INDICATOR (M-201), with the MONITOR-W.M. switch in the MONITOR position.

f. OSCILLATOR CONTROL. — This controls by means of screw actuated plungers, the length of the plate and/or cathode cavities. With the knob in the *out* position, both plungers are actuated simultaneously. With the knob pressed *in,* the plate screw is disengaged, allowing independent tuning of the cathode control for power peaking purpose. The relative positions of these two plungers are indicated on the plate and cathode counters.

g. WAVEMETER CONTROL. — This control actuates a lead-screw, which in turn changes the length of the quarter wave stub in the wavemeter. This control is geared to a drum dial visible through a window in the front panel, and said dial is calibrated directly in frequency.

3. SYSTEM OF TROUBLE LOCALIZATION.

a. The theory of localization of trouble in the CGZ-52ADR is best explained by reference to the following Block Diagram, figure 7-2, and the Trouble Shooting Chart, Table 7-3.

b. First ascertain which of the five major units is at fault:—

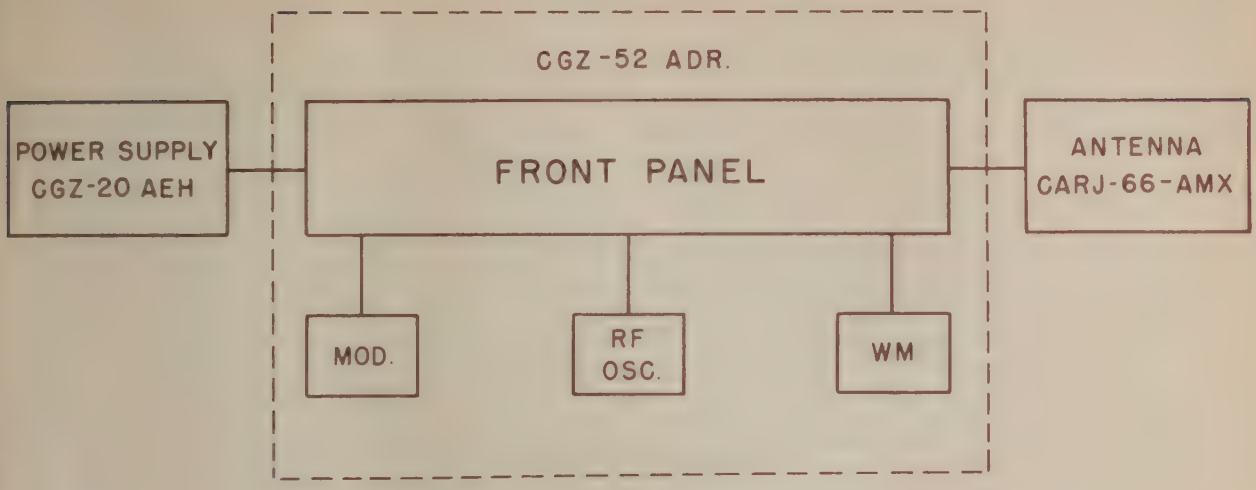


Figure 7-2 Block Diagram

(1) CGZ-20AEH Rectifier-Power Supply.
(2) CARJ-66AMX Antenna.
(3) Pulser Modulator.
(4) Oscillator.
(5) Wavemeter.

It should be noted that the front panel of the CGZ-52ADR is really a junction box for the entire system and connections to and from this panel should be carefully checked first.

c. When it has been definitely ascertained by reference to the Trouble Shooting Chart in table 7-3 that the difficulty is within one of the units, the procedure outlined in succeeding paragraphs of this section should be followed. It may be necessary to run the Power Supply CGZ-20AEH and the Target Transmitter CGZ-52ADR side by side on the bench for test purposes. The interconnecting cables on the front panel are not long enough to permit the units running in this position. It is suggested that temporary inter-connecting cables of sufficient length be made, using the appropriate connectors from the Spare Parts stock, as explained in the Cording Diagram, figure 3-4. These temporary cables will also be of value in servicing the units outlined in Section 1, paragraph 1b of this instruction book. This procedure was outlined in Vol. 1 of the OCY-1 instruction book series. Reference may be made to Vol. 1 covering the CGZ-52ADN, section 7, paragraph 3a.

d. Before dismantling the unit for servicing, the following outline and subsequent detailed information should be carefully studied. It is only necessary to remove the transmitter from the rack when:—

(1) Changing the Wavemeter or Power indicator crystals.

(2) Replacing the JAN 2C43 (V-401) Oscillator tube.

(3) Removing the Modulator-Pulser chassis from the base plate.

(4) Removing the Wavemeter unit.

It is only necessary to remove the front panel when the Oscillator cavity itself must be removed.

4. REMOVAL OF THE CGZ-52ADR FROM THE MT-257A/SPT-6 MOUNTING RACK.

Refer to figure 1-1, General View Radar DF Target Transmitter Equipment, Navy Model OCY-1 (2100 Mc. —3800 Mc.).

a. Remove the two large inter-connecting cables.

b. Remove the cable leading to the CARJ-66AMX antenna.

c. Loosen the four large knurled captive screws in the corners of the panel until the threads disengage.

d. Grasp the two handles and pull the CGZ-52ADR from the rack.

5. CHANGING ANTENNA COUPLING UNIT CRYSTAL.

a. Unsolder the wire from top of crystal.

b. Loosen check nut marked A in figure 7-4, Rear View Oscillator.

c. Remove crystal unit by turning in a counter-clockwise direction.

d. Remove four screws marked B in figure 7-3, Crystal Holder Assembly.

e. Lift off top of crystal holder carefully.

f. Loosen but do not remove screw marked C.

g. Press gently on the loop end of the crystal and draw the crystal out of its holder from the end opposite the loop.

h. The new crystal should be inserted in the reverse

of the above order. Make sure that the loop is returned to its original shape.

i. Make a small pencil mark on the crystal housing so that the plane of the loop may be kept in mind. Screw the crystal holder back into the antenna coupling unit in such a way that the plane of the loop is parallel to the transmission line, or in other words, in the maximum coupling position.

CAUTION

Do not screw the crystal assembly in far enough for the crystal loop to touch the center conductor in the antenna coupling unit. Failure to observe this will burn out the crystal.

j. Some crystals may be so hot that the R.F. INDICATOR will go off scale at some frequencies. If this should happen, rotate the crystal holder sufficiently to eliminate the trouble.

k. After the crystal has once been set, tighten the check nut A in figure 7-4, Rear View Oscillator.

6. CHANGING THE WAVEMETER CRYSTAL.

a. To remove crystal, unsolder wire from top of crystal unit. Loosen set screw B shown in figure 7-4, Rear View Oscillator. The crystal may now be removed from the wavemeter in the same way as the Antenna Coupling crystal, and the same procedure should be followed.

b. In the case of the Wavemeter crystal the plane of the loop for maximum coupling is parallel to the Wavemeter unit itself.

7. REPLACING JAN 2C43 (V-401) OSCILLATOR TUBE.

a. Unsolder the cathode and filament wires at the rear of the oscillator unit as shown in figure 7-4 Rear View Oscillator.

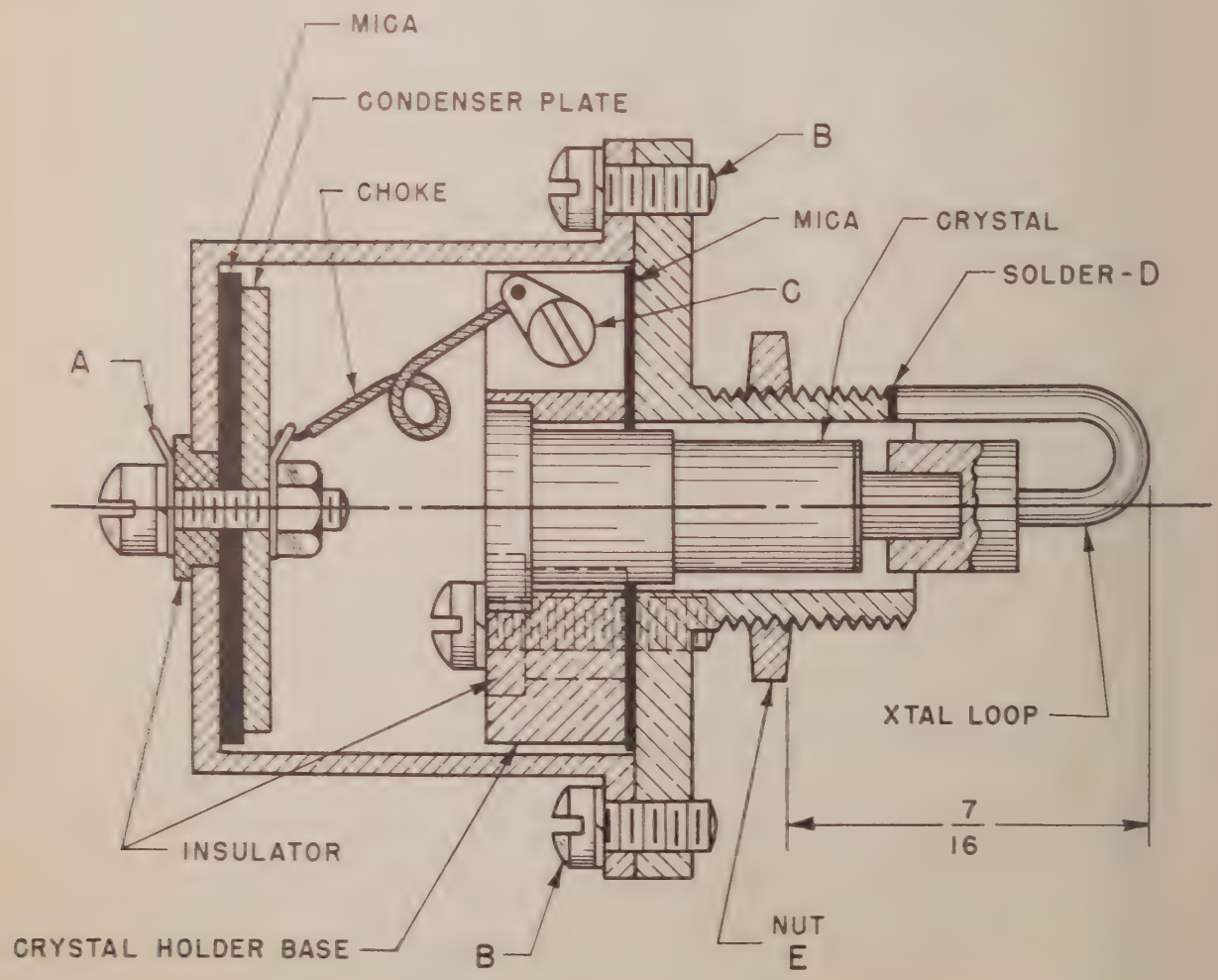


Figure 7-3. Crystal Holder Assembly

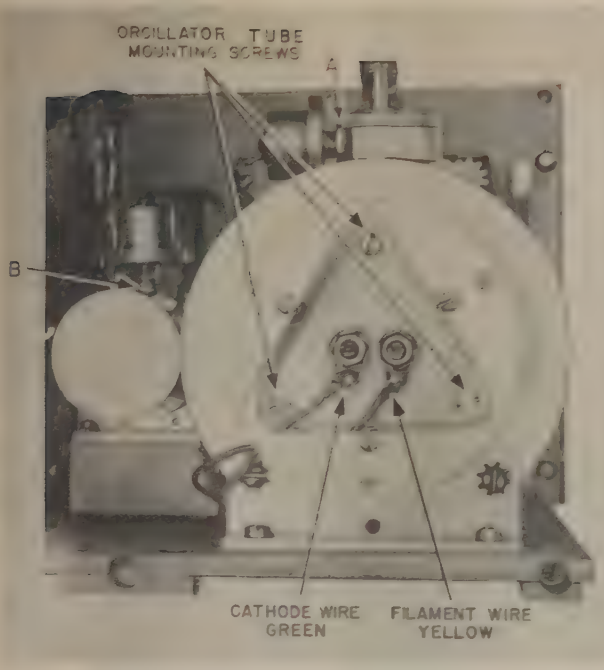


Figure 7-4. Rear View Oscillator

b. Remove the three screws marked, Oscillator Tube Mounting Assembly Screws.

c. Turn the MAIN TUNING knob on the front panel counter-clockwise until the cathode piston mounting block is about two inches from the oscillator and plate. See figure 7-5, Removing Oscillator Tube and Mount.

d. Grasp the oscillator tube mounting flange as shown in figure 7-5, Removing Oscillator Tube and Mount, and remove the tube mounting assembly by passing it through the triangular hole of the cathode piston mounting block.

e. Figure 7-6, Oscillator Tube and Mount, shows the assembly that has just been removed. The tube may now be pulled from its socket and be replaced.

f. Sometimes the tube is held in the cavity by the plate fingers when the tube mounting assembly is removed. If this happens, it may be necessary to reach into the cavity and pull the tube out after the mounting has been removed. In all cases, however, when the tube is replaced it should be plugged into the mounting first.

g. After replacement, re-assembly should be in the reverse order, making sure that the two wires on the rear of the mount are replaced correctly as to color. Refer to figure 7-4, Rear View Oscillator.

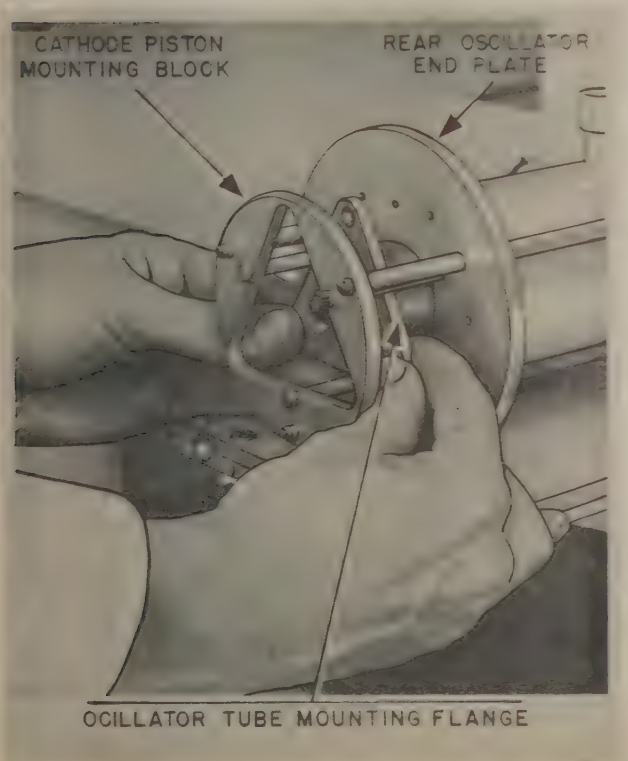


Figure 7-5. Removing Oscillator Tube and Mount

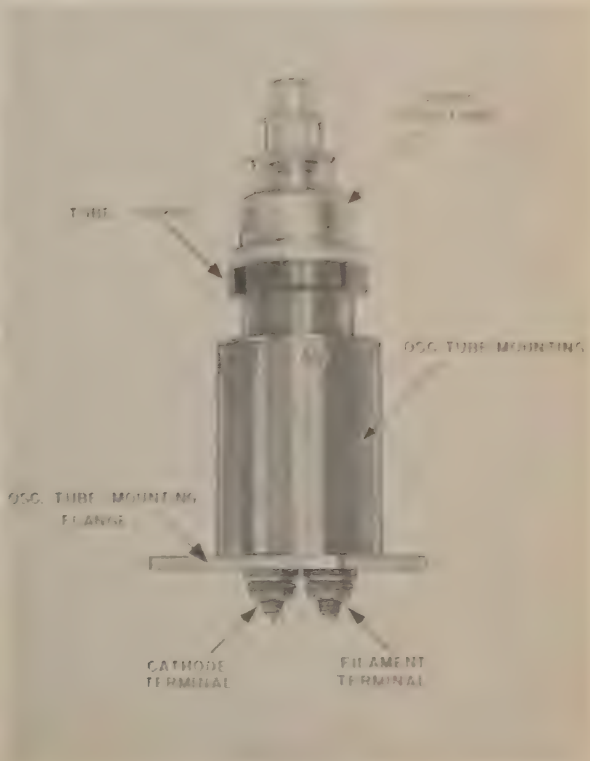


Figure 7-6. Oscillator Tube and Mount

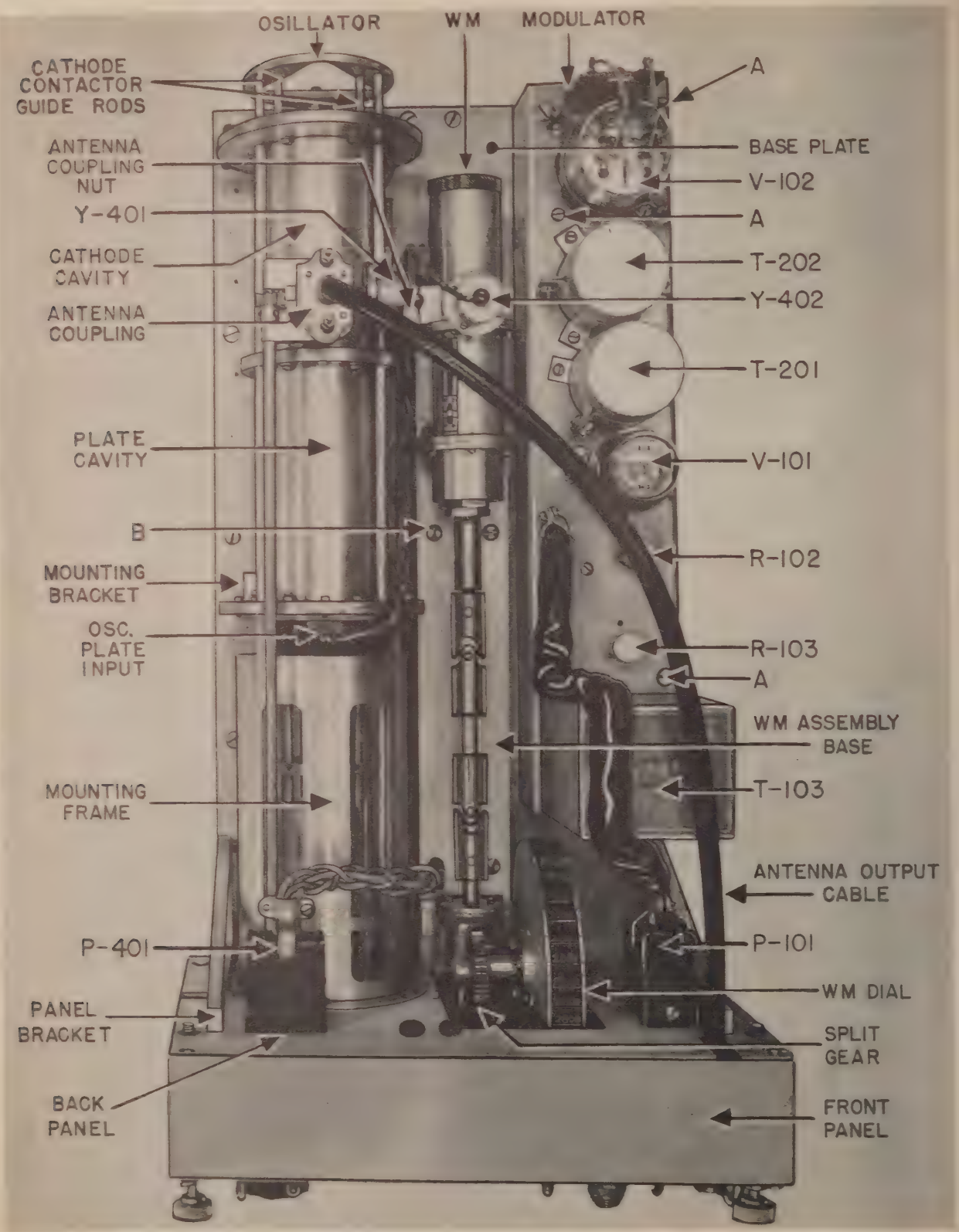


Figure 7-7. Top View of CGZ-52ADR

8. PULSER-MODULATOR.

a. In order to service this assembly for anything other than tubes, it will first be necessary to remove it from the main base plate. Remove the Jones plug P-101, that connects the modulator to the front panel. This is indicated in figure 7-7, Top View CGZ-52ADR.

b. Loosen the captive screws until the threads are free, as indicated in figure 7-7, Top View CGZ-52ADR. The modulator chassis may now be lifted from the base plate.

c. For general servicing of this unit reference should be made to the following figures:

(1) Table 7-3, Trouble Shooting Chart.

(2) Figure 7-8, Bottom View of Modulator Chassis.

(3) Figure 7-13, Modulator Chassis Wiring Diagram.

(4) Figure 7-23, Schematic Diagram.

(5) Figure 7-15, Modulator Resistance Chart.

(6) Figure 7-14, Modulator Voltage and Resistance Chart.

Careful check of voltages and resistances as outlined in the above illustrations should show any defective components.

d. PULSE LENGTH AND SHAPE. — The requirements of the pulse length and shape in the CGZ-52ADR are not stringent. The shape of the pulse produced by the 6L6 blocking oscillator will not be rectangular. This is considered advantageous since it provides an easy method of recognizing the pulse through interference at the receiver end. Any pulse length from two to seven micro-seconds is satisfactory and components of standard tolerances in the unit will produce pulses within these limits.

e. REPETITION RATE (RECOGNITION HIGH-LOW). — The repetition rates are pre-set to two frequencies, 540 p.p.s. and 590 p.p.s. as controlled by the RECOGNITION HIGH-LOW switch. After servicing, it may be necessary to re-set the frequency. If so, the transmitter should be set up for a standard method of measuring P. R. F. The screwdriver potentiometers, R-102 and R-103, shown in figure 7-8, Bottom View of Modulator Chassis, controls these frequencies. The caps on the top of the chassis, marked R-102 and R-103 as shown in figure 7-7, Top View CGZ-52ADR, should be removed and the potentiometers adjusted with a screwdriver as follows:—

(1) Set the RECOGNITION switch to the HIGH

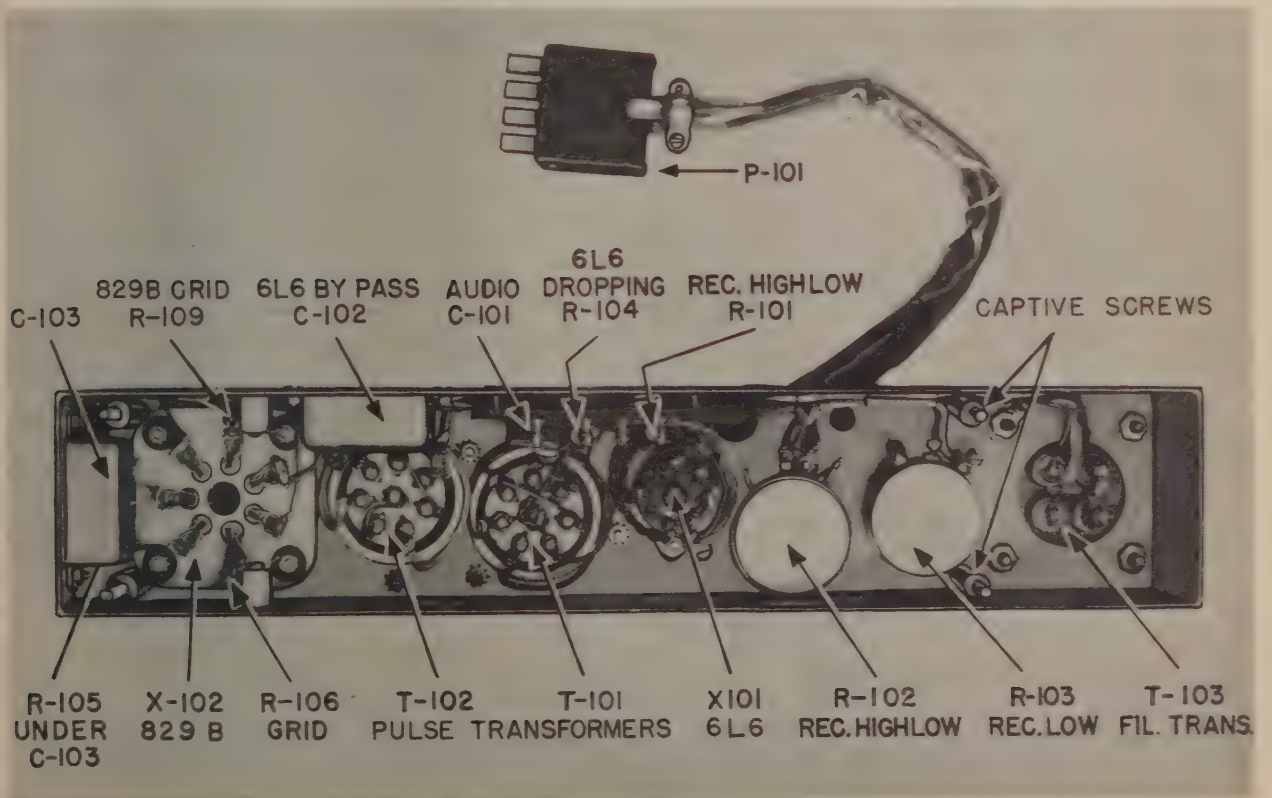


Figure 7-8. Bottom View of Modulator Chassis

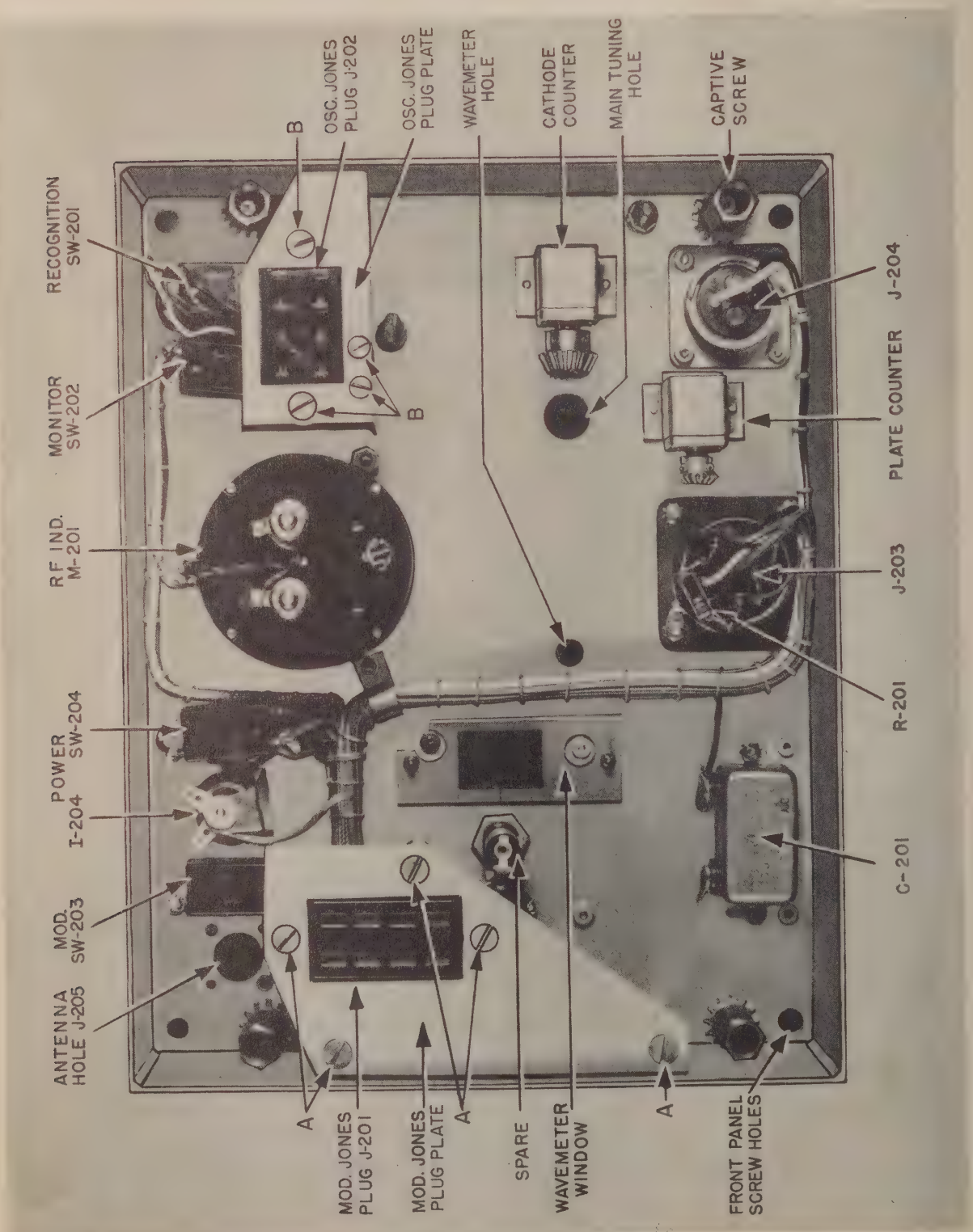


Figure 7-9. Rear View of Front Panel

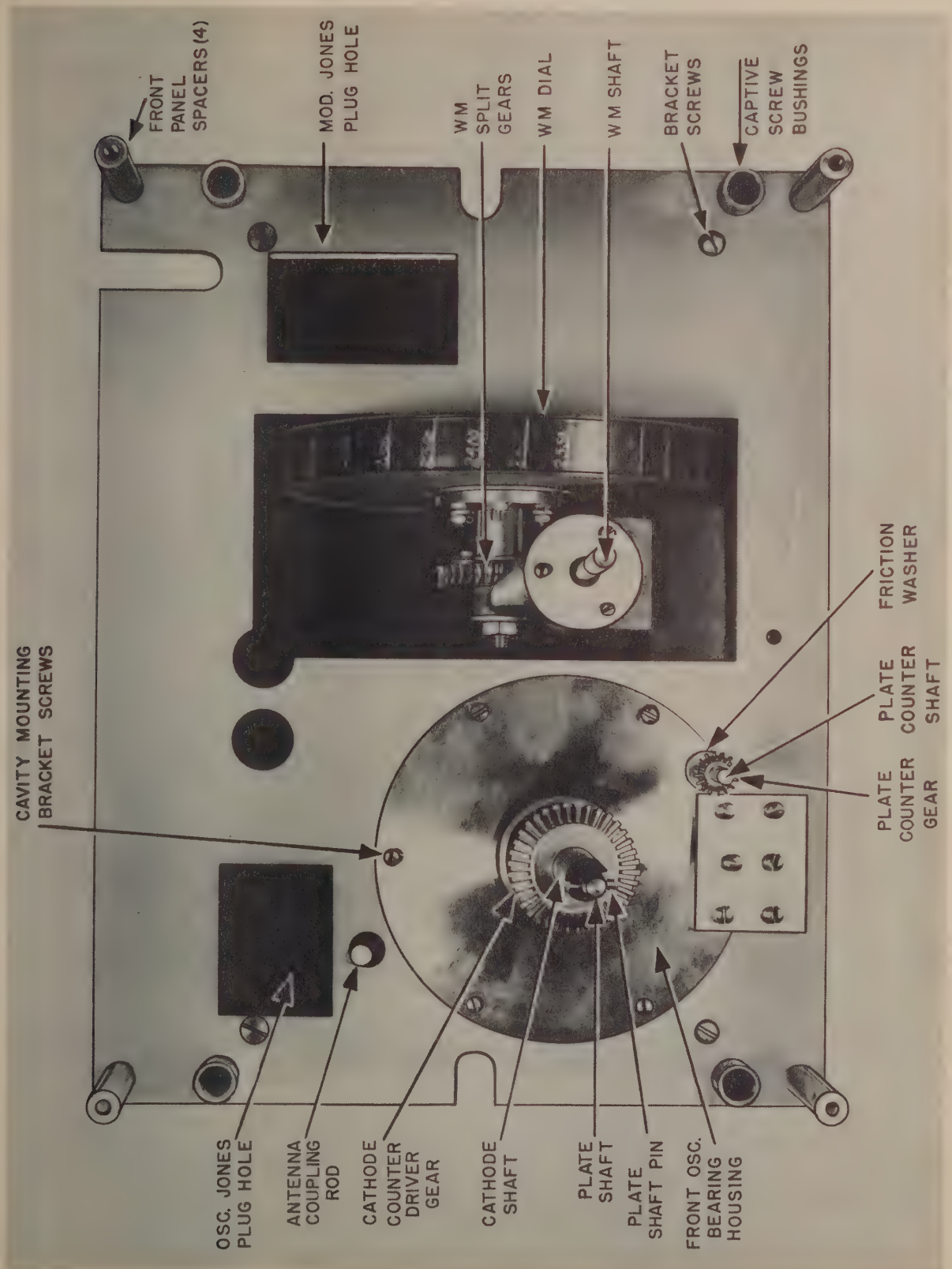


Figure 7-10. Front View of Rear Panel

position. Adjust R-102 until 590 p.p.s. is indicated.

(2) Set the RECOGNITION switch to the LOW position. Adjust R-103 until 540 p.p.s. is indicated.

(3) Both frequencies should again be checked by means of the RECOGNITION switch, after which the covers should be securely placed over the potentiometers.

9. WAVEMETER.

a. GENERAL. — The construction of the wavemeter is such that under normal usage it should maintain its stability for the life of the CGZ-52ADR Transmitter. The wavemeter stub is actuated by a micrometer type screw which may have a tendency to wear and to produce backlash after several years of operation. Provision has been made to eliminate this backlash, and will be explained below.

b. RE-CALIBRATION. — After any major adjustment, the wavemeter should be re-calibrated against a Frequency Standard.

c. REMOVAL OF WAVEMETER UNIT. — Refer to figure 7-7, Top View CGZ-52ADR.

(1) Remove screws marked B that attach the wavemeter assembly to the main base plate.

(2) Unscrew the ANTENNA COUPLING nut.

(3) Unsolder the wire from the top of the crystal.

(4) Remove the wavemeter knob from the shaft that extends through the front panel.

(5) The wavemeter dial drive and main casting may now be removed from the base plate as a unit.

10. REMOVAL OF FRONT PANEL.

a. If trouble develops in the cable connections, or if the oscillator has to be removed, it will be necessary to remove the front panel. Refer to figure 4-1, Front View CGZ-52ADR.

(1) Remove the ANTENNA COUPLING knob.

(2) Remove the WAVEMETER knob.

(3) Remove the MAIN TUNING knob by first removing the three screws on the knob plate and then removing the $\frac{1}{4}$ x 20 nut under the plate.

(4) Remove the spring from the main tuning shaft in the rear of the knob.

(5) Remove the spring cup fastened by two Allen setscrews in the rear of the knob.

(6) Remove the oscillator Jones plug, P-401, from the rear of the panel. See figure 7-7, Top View CGZ-52ADR.

(7) Remove the modulator Jones Plug, P-101, shown in the same figure.

(8) Remove the four screws in the far corners of the front panel as shown in figure 4-1, Front View CGZ-52ADR.

(9) Remove the four screws that hold the antenna connector.

(10) The front panel may now be removed from the transmitter.

b. Trouble shooting this assembly is best accomplished by referring to the Schematic Wiring Diagram, figure 7-23, and the Panel Wiring Diagram figure 7-16.

11. OSCILLATOR.

Before servicing this assembly the Exploded View Oscillator Cavity in figure 7-22 should be carefully studied. The actual mechanical functions of the oscillator as a unit can best be determined in this manner, together with an examination of the unit itself.

a. CHANGING PLATE AND CATHODE COUNTERS. — If it becomes necessary to change counters or if the counters should slip out of register, the following procedure should be used.

(1) Remove the front panel as outlined in paragraph 10 of this section.

(2) Either counter may now be removed as shown in figure 7-9, Rear View of Front Panel.

(3) It will now be necessary to set the register on the counters to agree with the calibration curves. Refer to figure 7-10, Front View of Rear Panel. Turn the cathode and plate shafts counterclockwise as far as possible.

(4) Set the counters by hand to read zero.

(5) The front panel may now be replaced.

b. REPLACING OSCILLATOR TUBE. — While the oscillator tube is a part of this assembly, it has been treated in its entirety in paragraph 7 of this section.

12. POWER SUPPLY.

The Power supply, CGZ-20AEH, is removed from the Mounting Rack MT-257A/SPT-6 by releasing the captive screws on the front panel by exactly the same method as used for the removal of the transmitter unit and covered in Section 7, paragraph 4 of this instruction book. The layout of the power supply is covered in figure 7-11, Top View of Rectifier Power Unit, and figure 7-12, Bottom View of Rectifier Power Unit. The above mentioned illustrations together with figure 7-23, Radar Transmitter CGZ-52ADR, and Rectifier Power Unit CGZ-20AEH Schematic Diagram, cover the electronic functions and values of this assembly.

13. ANTENNA.

For service on the CARJ-66AMX antenna, see the separate instruction book supplied with the antenna.

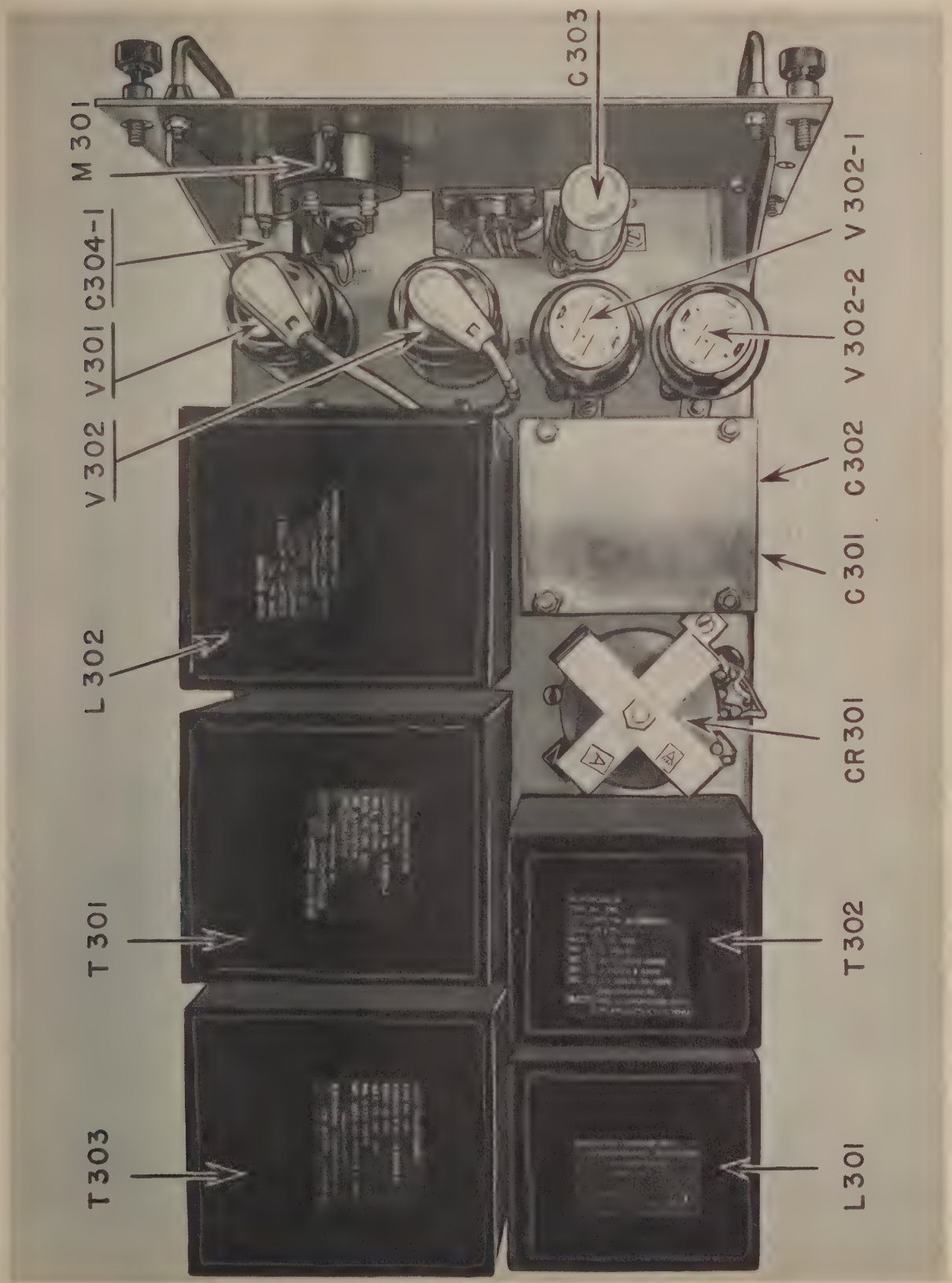


Figure 7-11. Top View of Rectifier-Power Unit

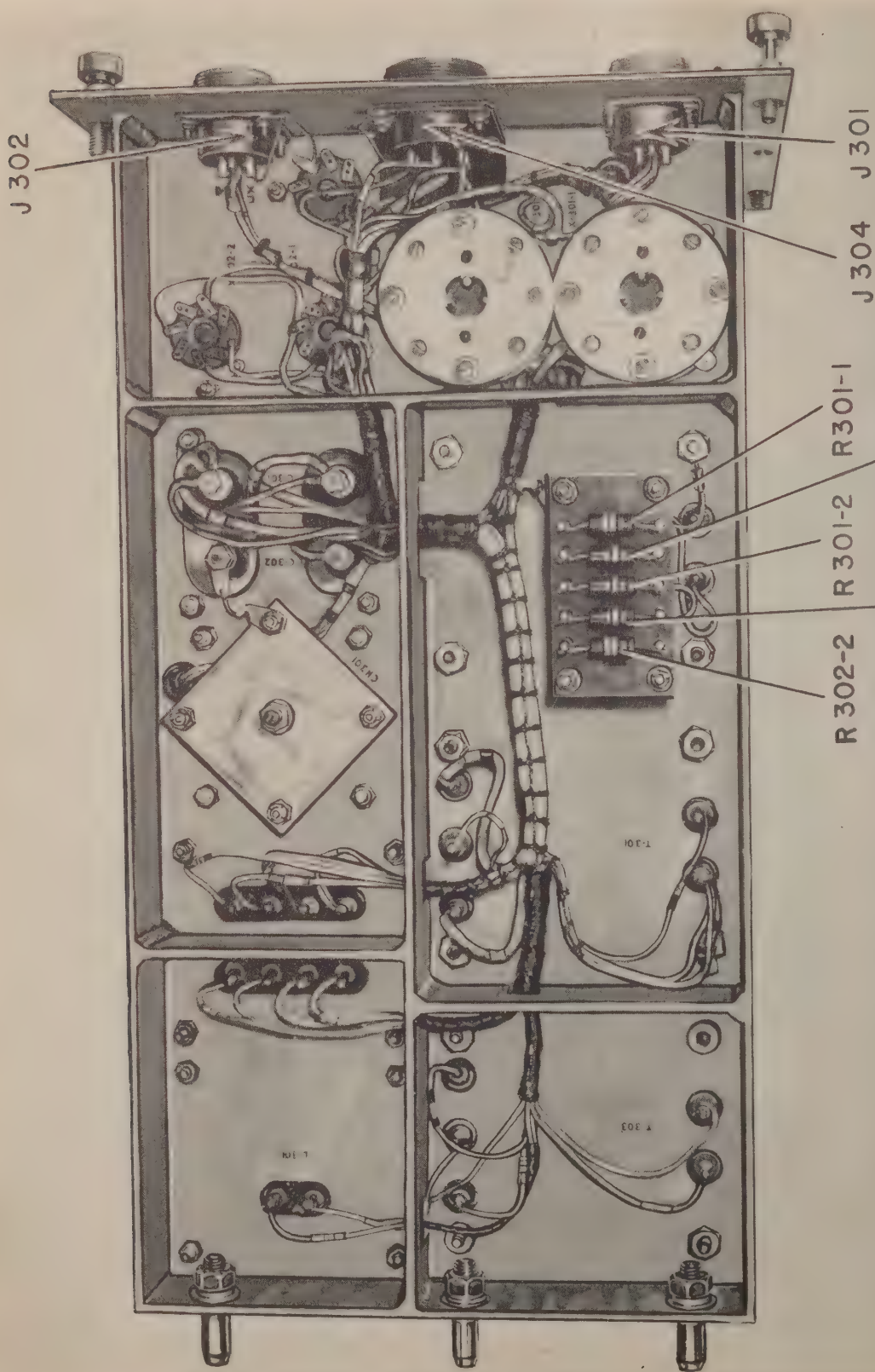


Figure 7-12. Bottom View of Rectifier-Power Unit

TABLE 7-1. TUBE CHARACTERISTICS

TUBE TYPE	FILAMENT VOLTAGE (V)	FILAMENT CURRENT (A)	PLATE VOLTAGE (V)	GRID BIAS (V)	SCREEN VOLTAGE (V)	PLATE CURRENT (MA)	SCREEN CURRENT (MA)	A-C PLATE RESIST-ANCE (OHMS)	VOLTAGE AMPLI-FICATION FACTOR (OHMS)	TRANS-CONDUCT-ANCE (MICROM HOS)	EMISSION	
											IS (MA)	TEST VOLT
2C43	6.3	0.9	PEAK 3000			2.5			48	8000		
6L6	6.3	0.9	250	—14	250	88	5.0	35,000	8	5500	275	50
829B	6.3	2.25	500	—38	200	120	10.0		7	8500	250	25
			MAXIMUM D.C. OUTPUT CURRENT (MA)						MAX. PEAK PLATE CURRENT (MA)			
1616	25	50				130				800	275	150
5R4GY	50	20				175				650	225	75

TABLE 7-2. TUBE OPERATING VOLTAGES & CURRENTS OF MODULATOR & OSCILLATOR UNITS

TYPE	FUNCTION	PLATE (V)	PLATE (MA)	SCREEN (V)	SCREEN (MA)	SUPPRESS. (V)	CATHODE (V)	GRID (V)	HEATER V (AC)
2C43	OSCILL	17 AC							6.3
829B	PULSE AMPLIF	1250		515					6.3
6L6G	PULSER	125		125					6.3

1000 OHMS PER VOLT METER USED FOR THESE READINGS

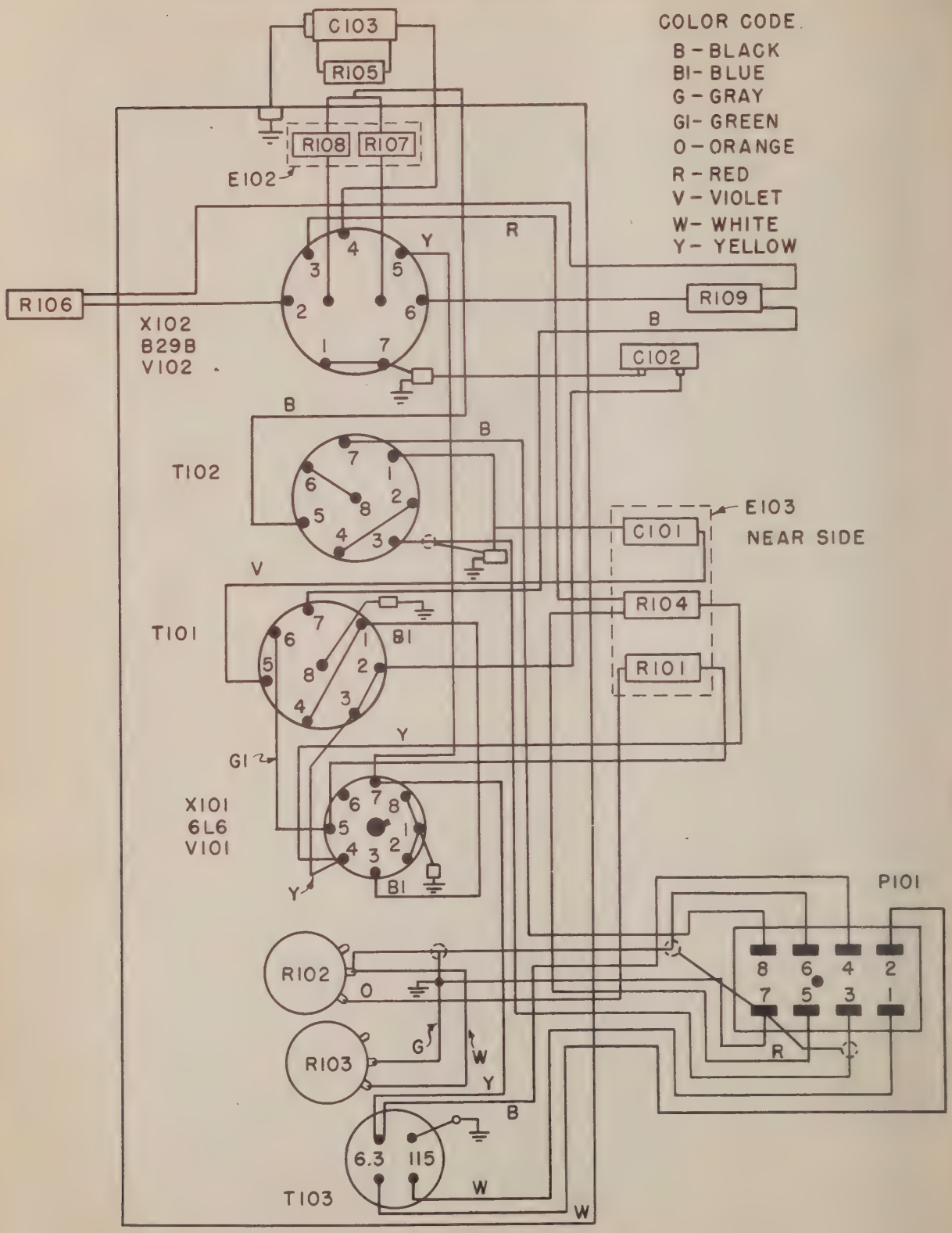
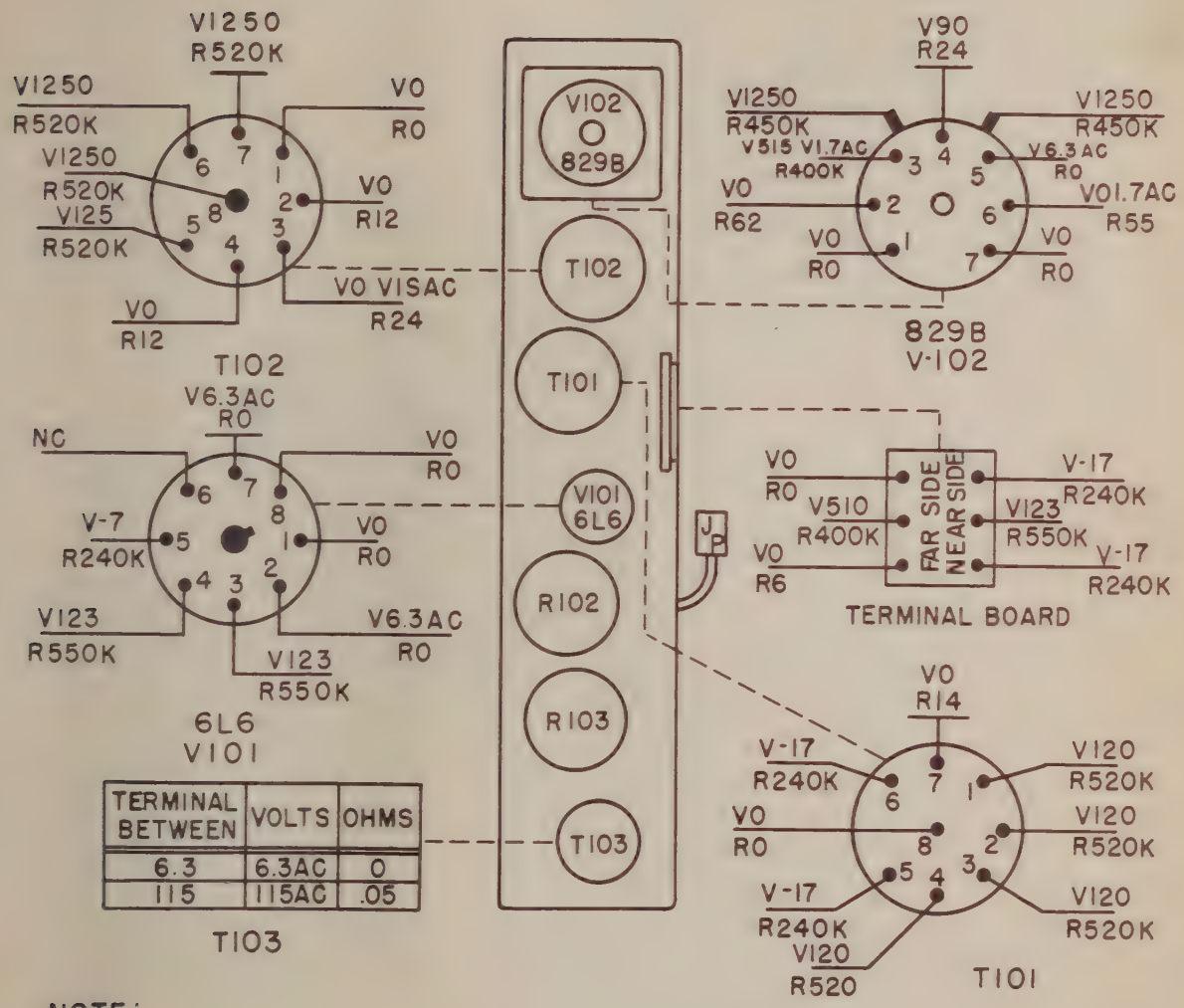


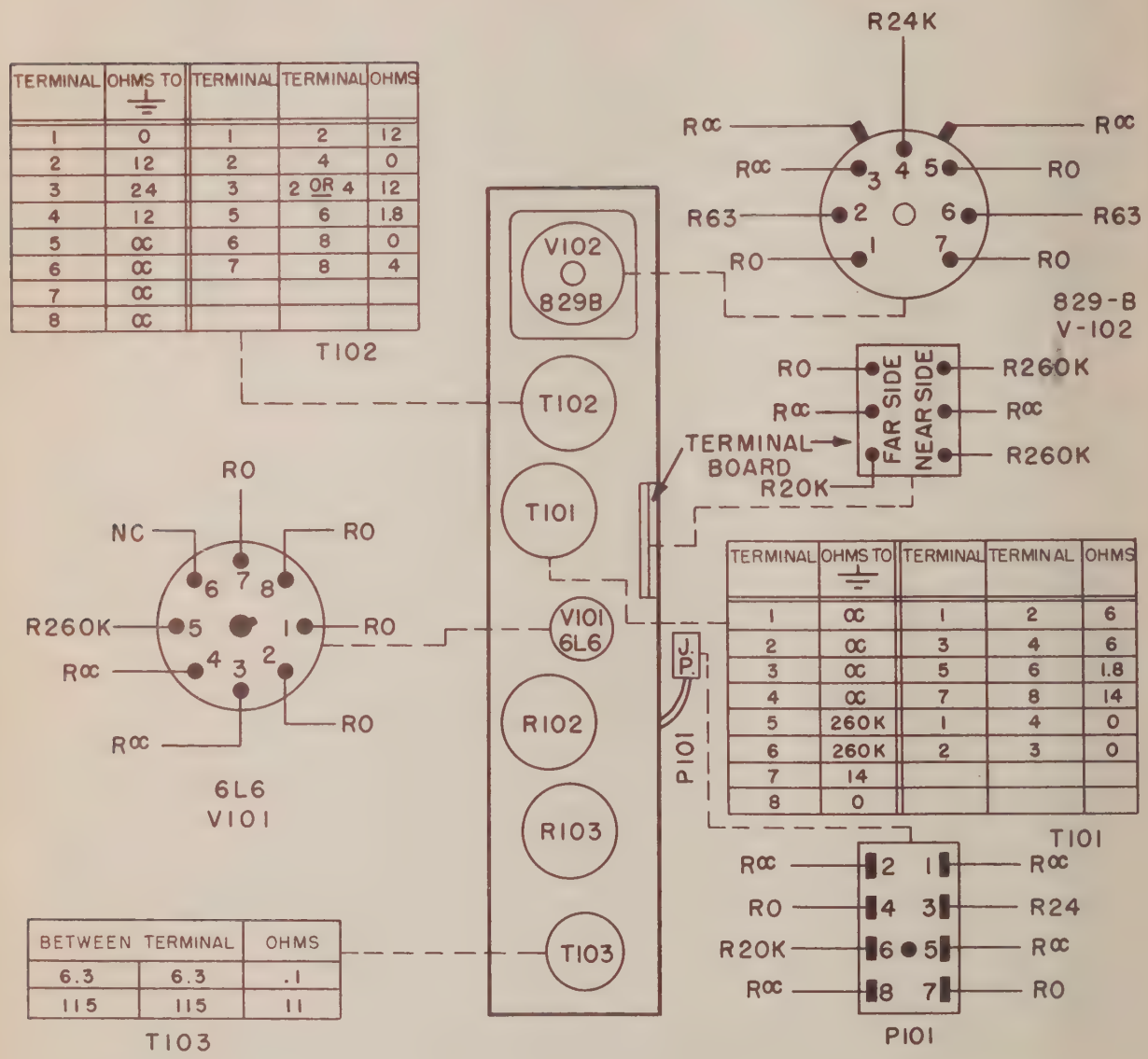
Figure 7-13. Modulator Chassis Wiring Diagram



NOTE:

1. *VOLTAGE READINGS* TAKEN WITH ALL CABLES CONNECTED.- POWER AND MODULATOR SWITCHES ON.
2. *RESISTANCE READINGS* TAKEN AT SAME CONDITIONS AS VOLTAGE READINGS EXCEPT THE LINE IS DISCONNECTED FROM J301.

Figure 7-14. Modulator Voltage and Resistance Chart



TERMINAL	OHMS TO ⏚	TERMINAL	TERMINAL	OHMS
1	0	1	2	12
2	12	2	4	0
3	24	3	2 OR 4	12
4	12	5	6	1.8
5	∞	6	8	0
6	∞	7	8	4
7	∞			
8	∞			

T102

TERMINAL	OHMS TO ⏚	TERMINAL	TERMINAL	OHMS
1	∞	1	2	6
2	∞	3	4	6
3	∞	5	6	1.8
4	∞	7	8	14
5	260K	1	4	0
6	260K	2	3	0
7	14			
8	0			

T101

BETWEEN TERMINAL		OHMS
6.3	6.3	.1
115	115	11

T103

NOTE:

1. ALL READINGS TAKEN WITH MODULATOR JONES PLUG DISCONNECTED.
2. RESISTANCES TO GROUND TAKEN WITH 1000 ~ PER VOLT OHMMETER.

Figure 7-15. Modulator Resistance Chart

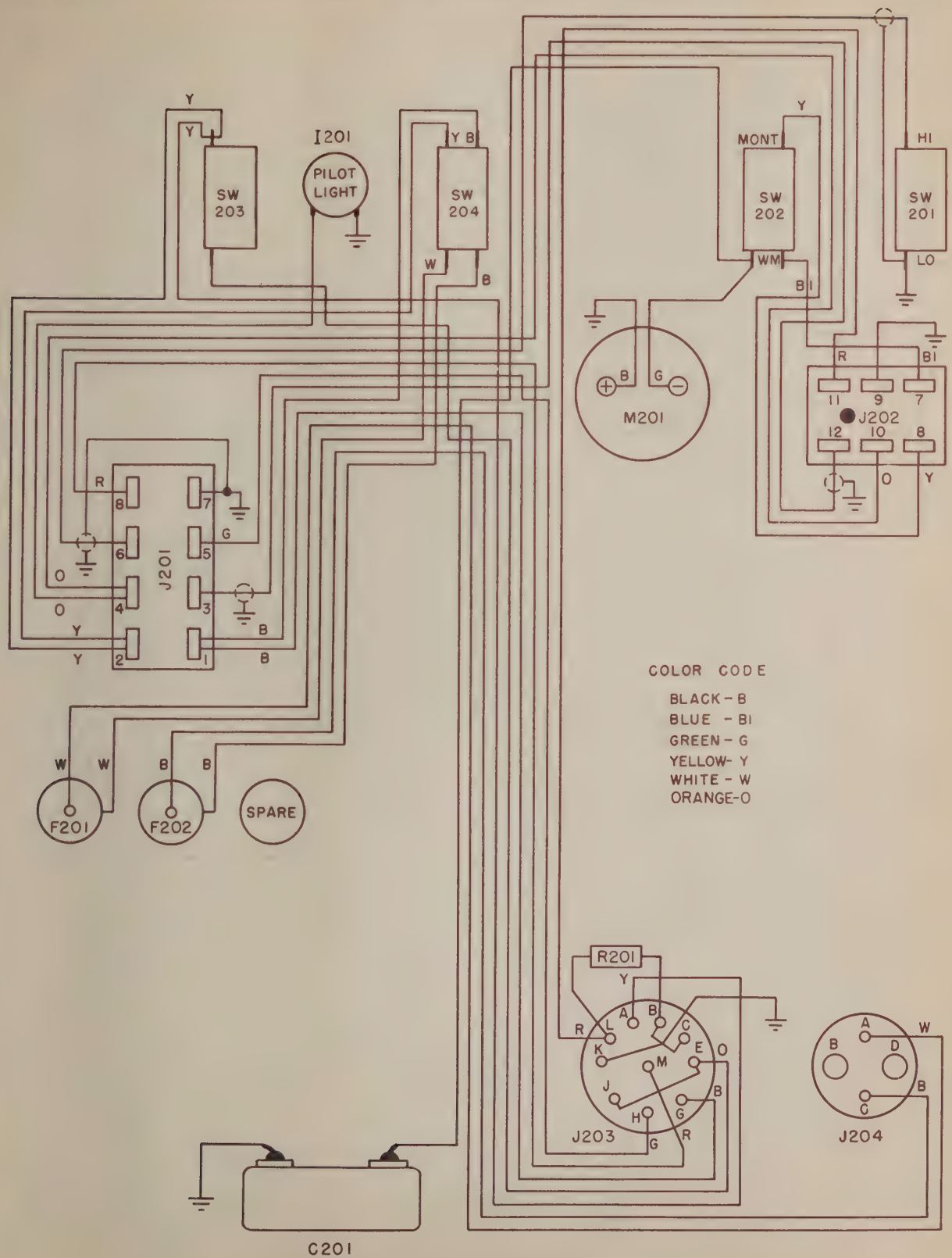


Figure 7-16. Front Panel Wiring Diagram

NOTE:
ALL READINGS TAKEN WITH P401 DISCONNECTED.

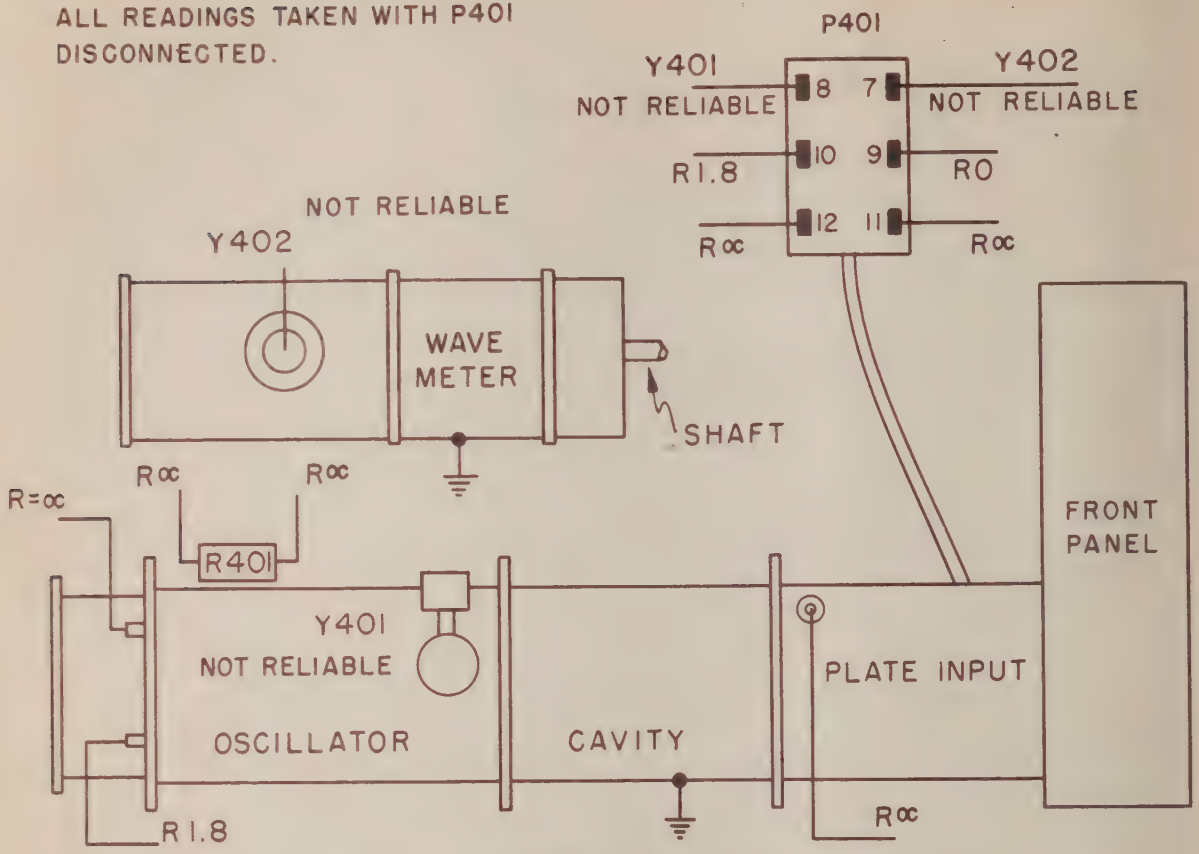
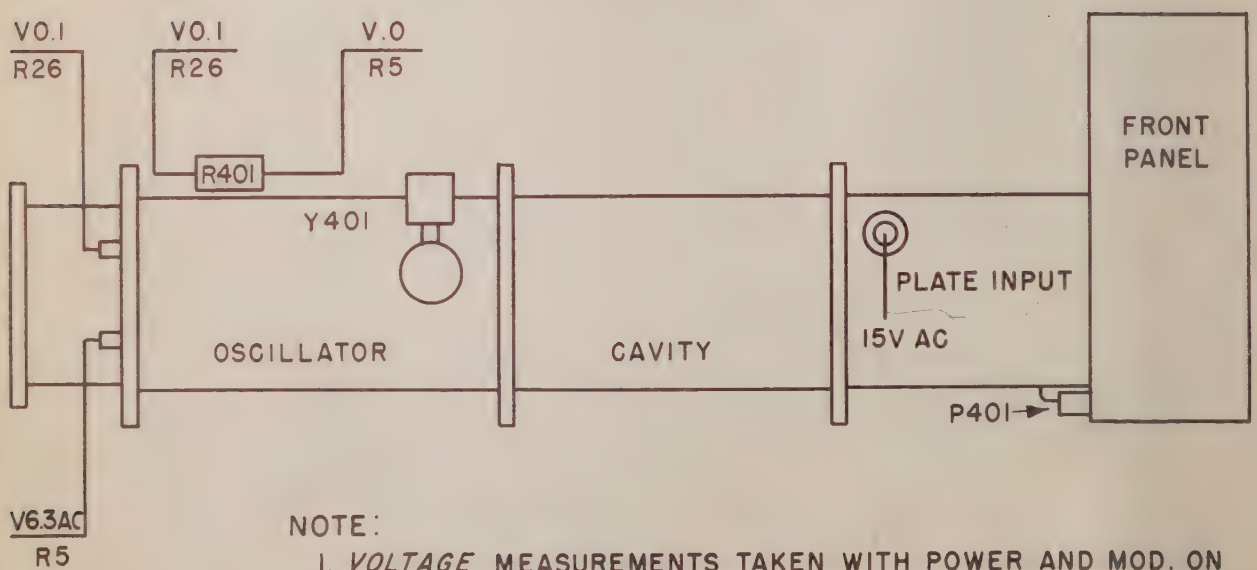


Figure 7-17. Oscillator Cavity Resistance Chart



NOTE:
1. *VOLTAGE* MEASUREMENTS TAKEN WITH POWER AND MOD. ON
2. *RESISTANCE* READINGS TAKEN WITH AC POWER CABLE DISCONNECTED FROM J301 OF THE RECTIFIER POWER UNIT.

Figure 7-18. Oscillator Cavity Voltage and Resistance Chart

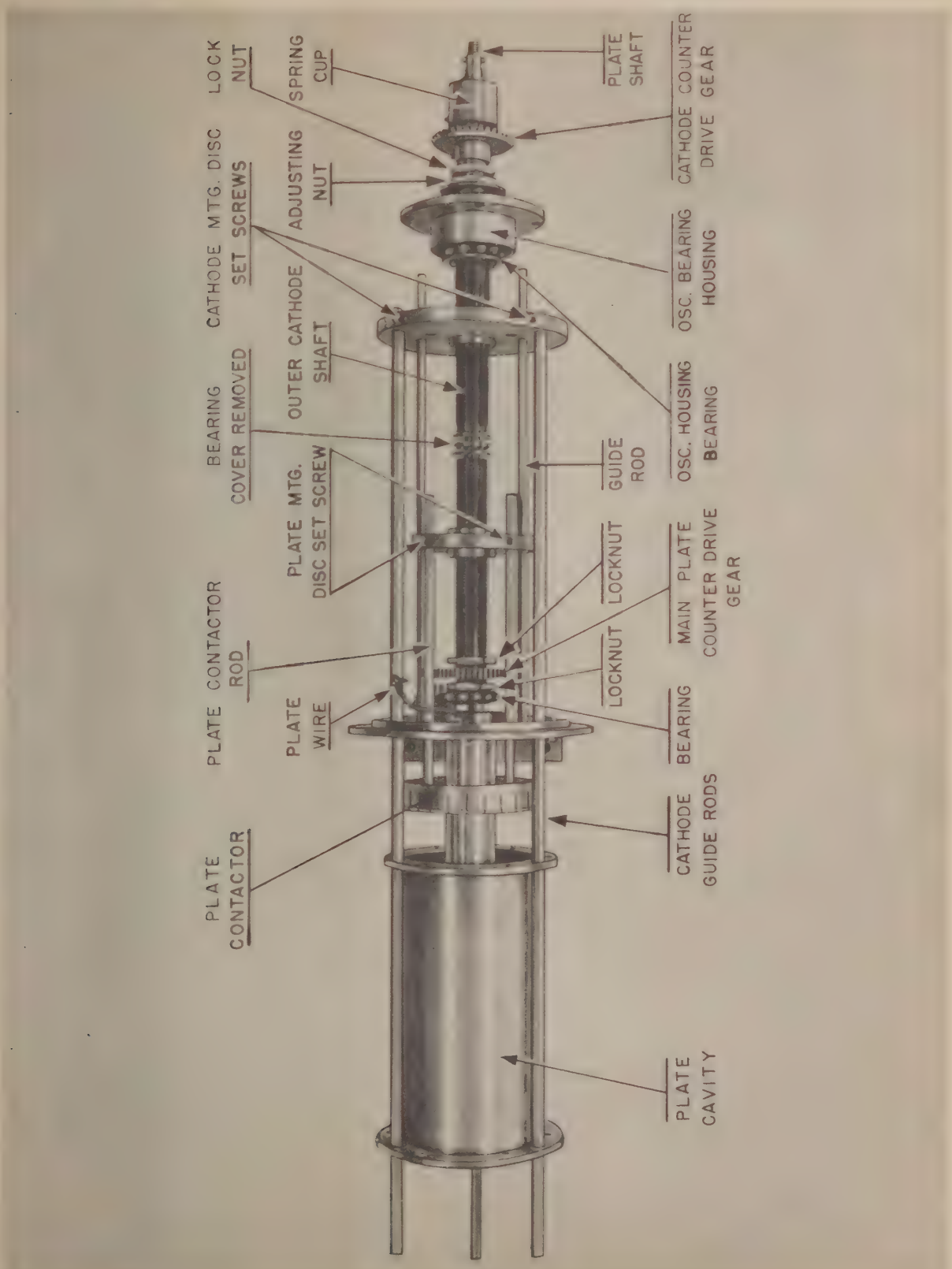


Figure 7-19. Part of Cavity with Mounting Frame Removed

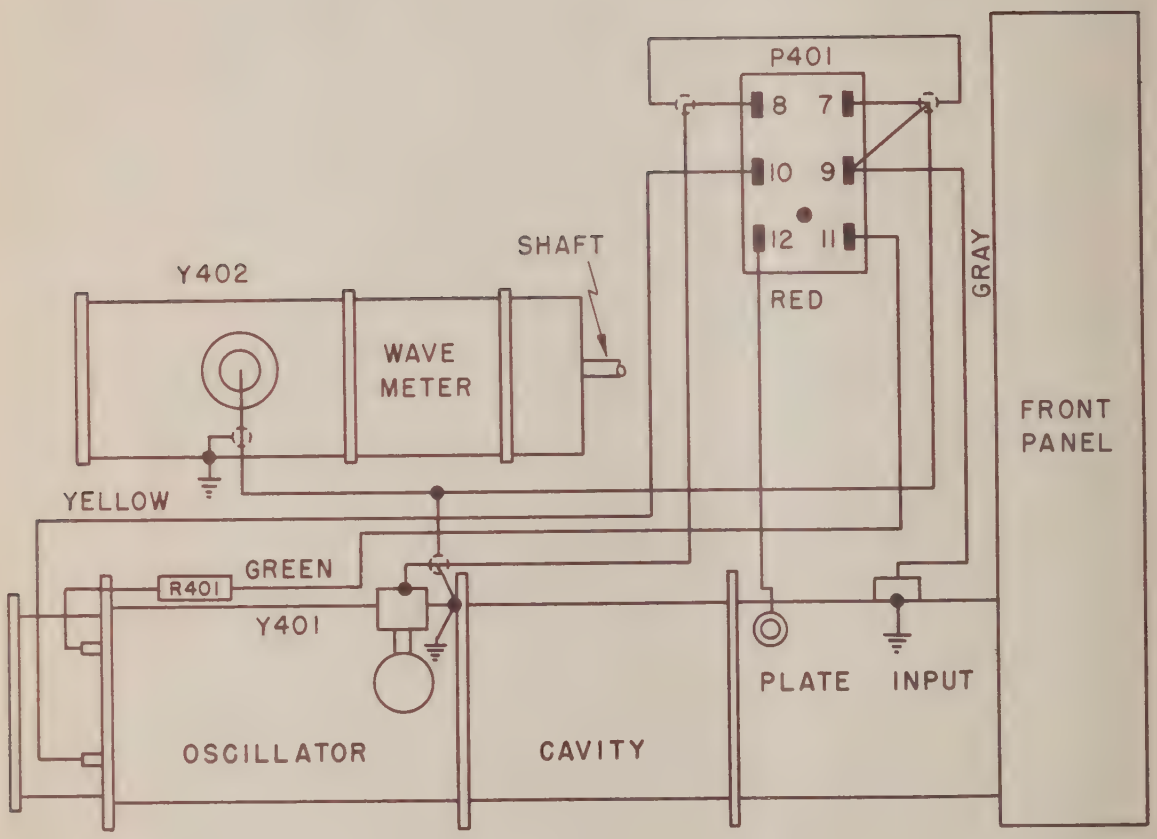


Figure 7-20. Oscillator Cavity and Wavemeter Wiring Diagram

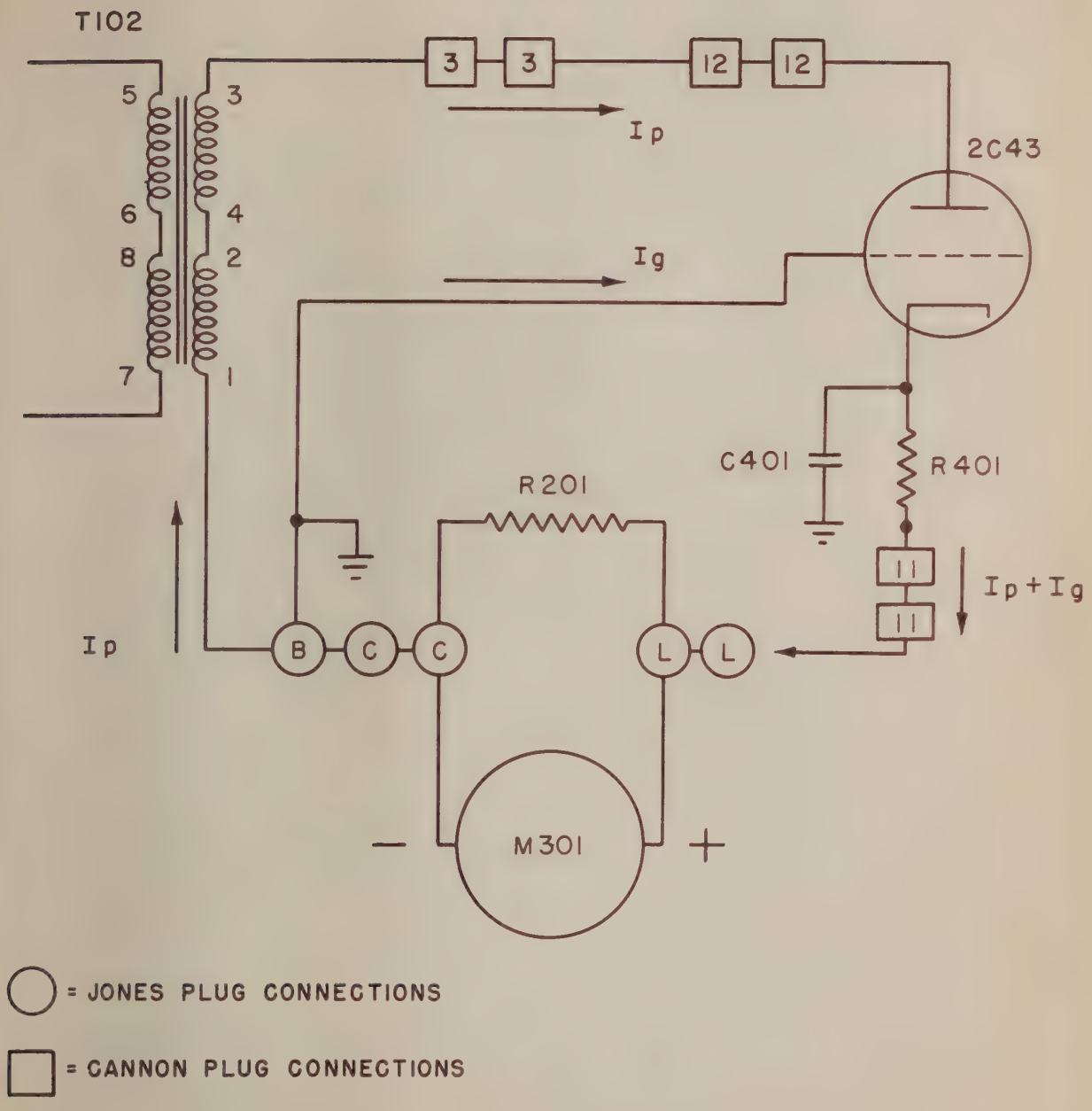


Figure 7-21. Rectifier Power Supply Meter Circuit

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Radar Df Target Transmitter Equipment, Navy Model OCY-1

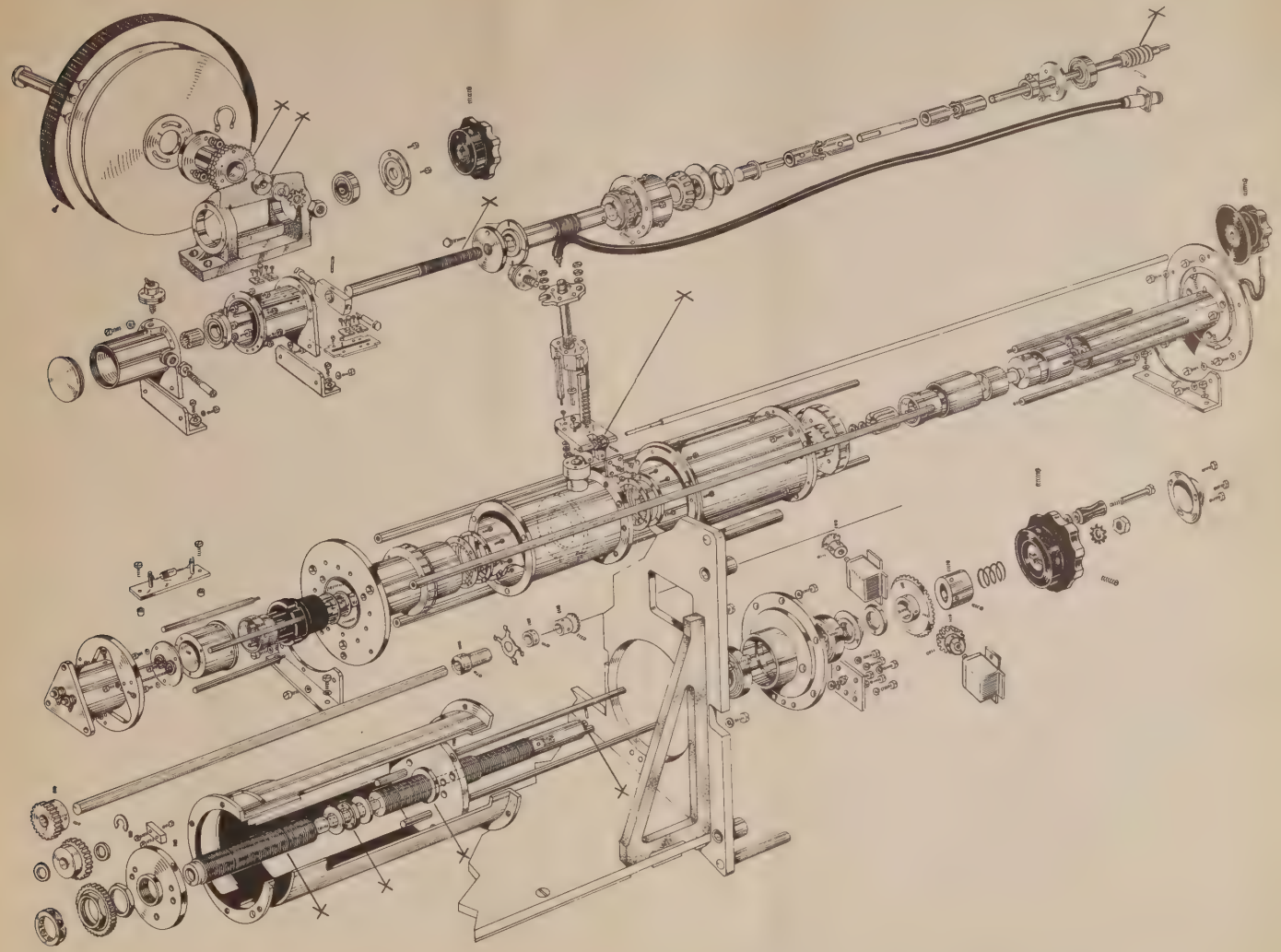

Figure 7-22. Exploded View of Oscillator Cavity

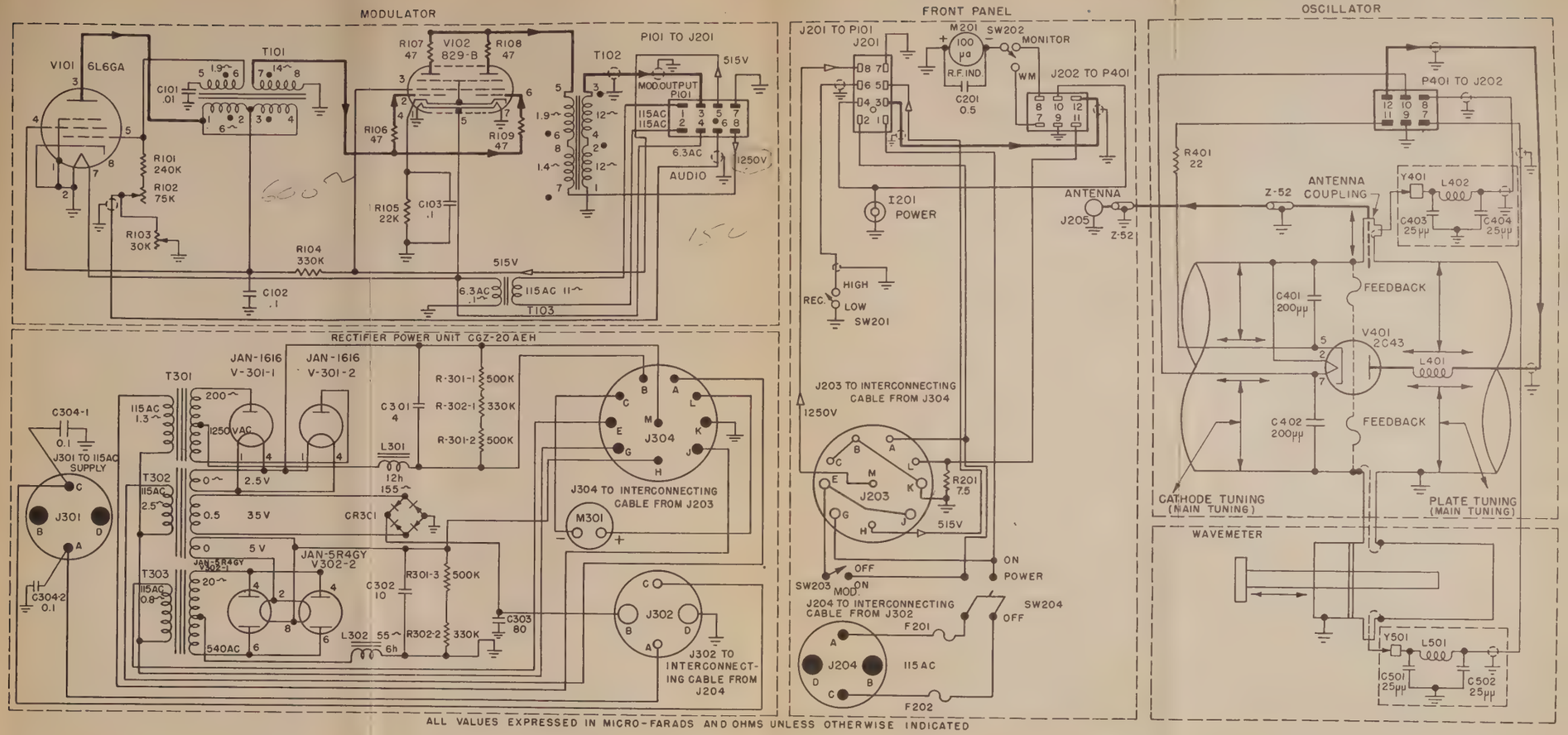

Figure 7-23. Radar Power Unit CGZ-20 AEH Schematic Diagram Transmitter CGZ-52ARD, and Rectifier

NAVSHIPS 91,011 Vol. 2
Radar Df Target Transmitter Equipment, Navy Model OCY-1

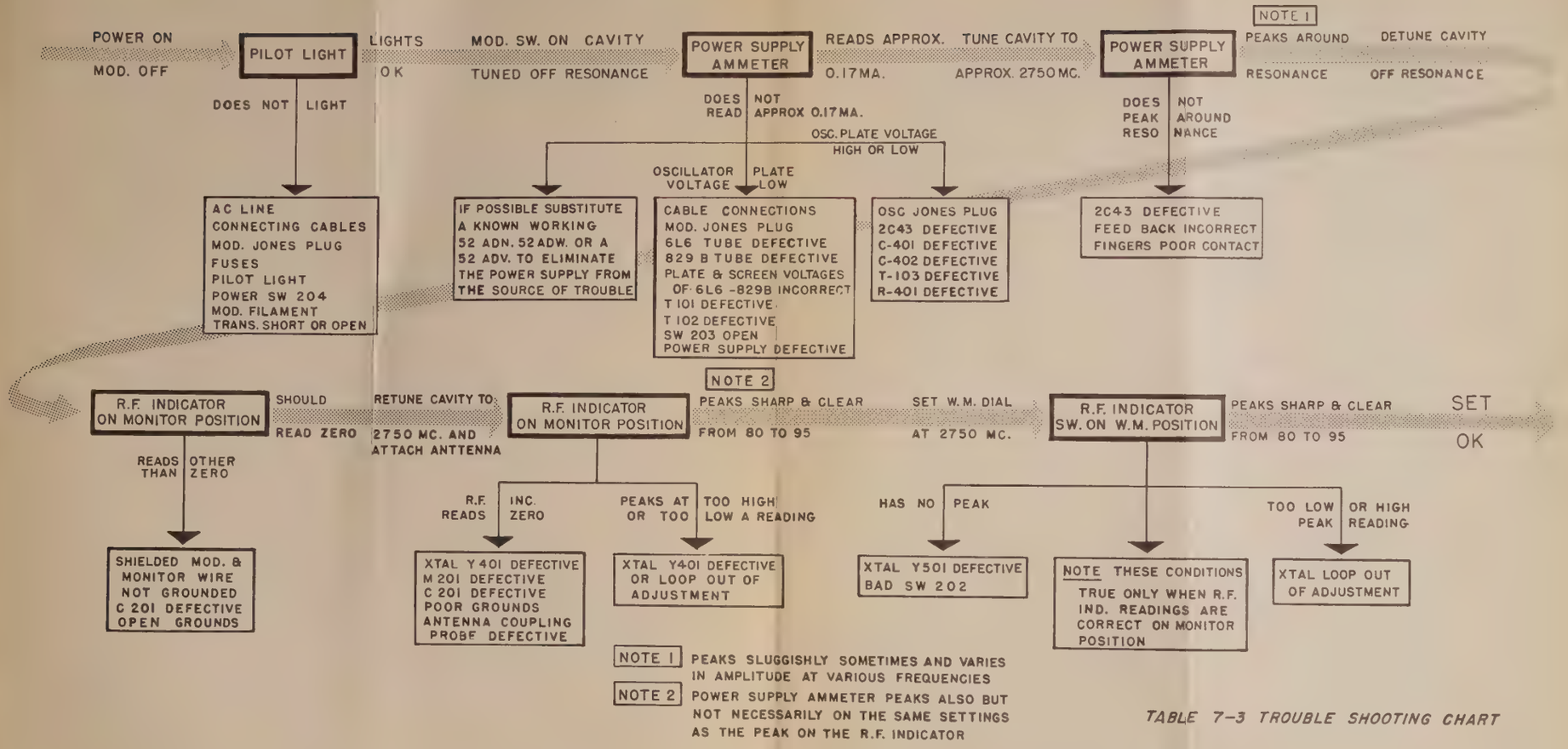
POWER ON
MOD. OFF
PILOT LIGHT
LIGHTS O K
MOD. SW. ON CAVITY TUNED OFF RESONANCE
POWER SUPPLY AMMETER
READS APPROX. 0.17MA.
TUNE CAVITY TO APPROX. 2750 MC.
POWER SUPPLY AMMETER
NOTE 1
PEAKS AROUND RESONANCE
DETUNE CAVITY OFF RESONANCE
DOES NOT LIGHT
AC LINE
CONNECTING CABLES
MOD. JONES PLUG
FUSES
PILOT LIGHT
POWER SW 204
MOD. FILAMENT TRANS. SHORT OR OPEN
DOES NOT READ APPROX 0.17MA.
OSC. PLATE VOLTAGE HIGH OR LOW
OSCILLATOR PLATE VOLTAGE LOW
IF POSSIBLE SUBSTITUTE A KNOWN WORKING 52 ADN. 52ADW. OR A 52 ADV. TO ELIMINATE THE POWER SUPPLY FROM THE SOURCE OF TROUBLE
CABLE CONNECTIONS
MOD. JONES PLUG
6L6 TUBE DEFECTIVE
829 B TUBE DEFECTIVE
PLATE & SCREEN VOLTAGES OF 6L6 -829B INCORRECT
T 101 DEFECTIVE
T 102 DEFECTIVE
SW 203 OPEN
POWER SUPPLY DEFECTIVE
OSC JONES PLUG
2C43 DEFECTIVE
C-401 DEFECTIVE
C-402 DEFECTIVE
T-103 DEFECTIVE
R-401 DEFECTIVE
DOES NOT PEAK AROUND RESONANCE
2C43 DEFECTIVE
FEED BACK INCORRECT
FINGERS POOR CONTACT
R.F. INDICATOR ON MONITOR POSITION
SHOULD READ ZERO
RETUNE CAVITY TO 2750 MC. AND ATTACH ANTTENNA
NOTE 2
R.F. INDICATOR ON MONITOR POSITION
PEAKS SHARP & CLEAR FROM 80 TO 95
SET W.M. DIAL AT 2750 MC.
R.F. INDICATOR SW. ON W.M. POSITION
PEAKS SHARP & CLEAR FROM 80 TO 95
SET OK
READS OTHER THAN ZERO
SHIELDED MOD. & MONITOR WIRE NOT GROUNDED
C 201 DEFECTIVE
OPEN GROUNDS
R.F. READS INC. ZERO
XTAL Y401 DEFECTIVE
M 201 DEFECTIVE
C 201 DEFECTIVE
POOR GROUNDS
ANTENNA COUPLING PROBE DEFECTIVE
PEAKS AT OR TOO TOO HIGH LOW A READING
XTAL Y401 DEFECTIVE OR LOOP OUT OF ADJUSTMENT
HAS NO PEAK
XTAL Y501 DEFECTIVE
BAD SW 202
NOTE THESE CONDITIONS TRUE ONLY WHEN R.F. IND. READINGS ARE CORRECT ON MONITOR POSITION
TOO LOW PEAK OR HIGH READING
XTAL LOOP OUT OF ADJUSTMENT
NOTE 1 PEAKS SLUGGISHLY SOMETIMES AND VARIES IN AMPLITUDE AT VARIOUS FREQUENCIES
NOTE 2 POWER SUPPLY AMMETER PEAKS ALSO BUT NOT NECESSARILY ON THE SAME SETTINGS AS THE PEAK ON THE R.F. INDICATOR

TABLE 7-3 TROUBLE SHOOTING CHART

SECTION 8
PARTS LIST

TABLE 8-1. WEIGHTS AND DIMENSIONS OF SPARE PARTS BOXES

EQUIPMENT SPARES						STOCK SPARES					
SPARE PARTS BOX	OVERALL DIMENSIONS			VOLUME	WEIGHT	SPARE PARTS BOX	OVERALL DIMENSIONS			VOLUME	WEIGHT
	HEIGHT	WIDTH	DEPTH				HEIGHT	WIDTH	DEPTH		
1	18¼	9½	6¼	0-6	30	2	24½	15	10	2-1	45

Unless otherwise stated, dimensions are inches, volume cubic feet in twelfths, weight pounds.

TABLE 8-2. SHIPPING WEIGHTS AND DIMENSIONS OF SPARE PARTS BOXES

EQUIPMENT SPARES							STOCK SPARES						
SHIPPING BOX NUMBER	SPARE PARTS BOX	OVERALL DIMENSIONS			VOLUME	WEIGHT	SHIPPING BOX NUMBER	SPARE PARTS BOX	OVERALL DIMENSIONS			VOLUME	WEIGHT
		HEIGHT	WIDTH	DEPTH					HEIGHT	WIDTH	DEPTH		
2	1	23	13	9	1-6	46	4	2	27½	16⅓	11½	3-1	61

Unless otherwise stated, dimensions are inches, volume cubic feet in twelfths, weight pounds.

TABLE 8-3. LIST OF MAJOR UNITS

QUANTITY	NAME OF MAJOR UNIT	NAVY TYPE	DESIGNATION
1	CGZ-52ADR TARGET TRANSMITTER	CGZ-52ADR	TRANSMITTER
1	*ANTENNA	CARJ-66AMX	ANTENNA

*GOV'T FURNISHED

TABLE 8-4 COMBINED PARTS AND SPARE PARTS LIST

PARTS										SPARE PARTS			
										EQUIP.		STOCK	
SYMBOL DESIG.	NAME OF PART AND DESCRIPTION	FUNCTION	AWS-JAN OR NAVY TYPE DESIG.	NAVY STOCK NO.	ARMY STOCK NO.	MFR'S AND MFR'S DESIG.	CONTR'S DWG OR PART NO.	ALL SYMBOL DESIG INVOLVED	QUAN PER SET	ON EQUIP	REQD	ON HAND	REQD
	MODULATOR SECTION OF TRANSMITTER												
C101	Capacitor; Fixed Silvered Mica .01MFD ± 5% - 300 V.D.C. Working 53/64 long 53/64 wide x 9/32 thick .040 Axial Leads 1-1/4 long.	Pulse Rate	CM35C 103J			6 1464	0349	C101	1	1	1	2	1
C102	Capacitor; Fixed paper oil Impregnated .1 MFD ± 10% 600 Volt D.C. working metal case 1-13/16 long x 1" wide x 3/4" high. 3/16 Mounting Holes 2-1/8" centers Soldering Lug Terminals (side).	By Pass	CP50B1 EF 104K			6 630M	0350	C102 C103	2	1	1	2	3
C103	Same as C102.												
E101	Insulator; Cone ceramic, tapped on. end 6-32, top diameter 7/16" bottom diameter 5/8", height 5/8" Hardware, Insulating Washer, 1 Brass N.P. washer, two 5/16 x 6-32 Binding Head Screws.	Insulator For 829B Grid Parasitic Suppressor				17 1300	054	E101	2	1	1	2	4
E102	Terminal Board: XXX Bakelite 1-3/4 long 1-3/4 wide 1/8" thick. Four Cambridge Thermionic #1724-D Turret Lugs Riveted on. Two .144 Holes 1-1/4 centers for Mounting.	829B Parasitic Resistor Board				1 P194-A-153	0559	E102	1	1	-	2	1

E103	Terminal Board XXX Bakelite 2-5/8" long 1-1/2" wide 1/8" thick. Six Cambridge Thermionic #1724-D Turret Lugs Riveted on. Two 145 Holes CSK. 2-1/16" centers for Mounting.	Resistor and Capacitor Term. Board				1 P194-A-183	0560	E103	1	1	0	2	1
E104	Plate, Clip for 829B Tube. Phosphor Bronze, Silver Plated.	Plate Clip 829B				128 36021	0556	E104	2	1	0	2	1
H101	Tube Clamp, consisting of 2 Brass N.P. Posts 1/4" Diam. 1-3/8" long tapped 6-32 x 3/8" deep at bottom one post with 1/8" slot 1/16" deep 1-3/16" from bottom other 1/8" hole 1-3/16" from bottom. Clamp #16 Phosphor Bronze wire 1-5/16" diam. Mounting centers between posts 2-5/8".	Hold V101				1 Group 111	085	H101	1	1	0	2	1
H102	Tube Clamp; consisting of 2 Brass N.P. Posts 1/4" diam. 1-7/16" long tapped 6-32 x 3/8" deep at bottom. One post with 1/8" slot 1/16" deep. 1-1/32" from bottom, other 1/8" hole 1-1/32" from bottom. Clamp .050 Diam. Spring Wire bent 2' Diam. Mounting centers between Posts 2-5/8".	Hold V102				1 P194-A70 P194-A71 P194-A72	0557	H102	1	1	0	2	1
H103	Screw Modulator Chassis C.R. steel Rhodium Plated Shank. .160 Diam. 2-9/16" long. Threaded 10-24 1/2" from end. .046 Slot cut 1-3/4" from head for slip washer. Head .375 Diam. 3/16" thick slotted for Screw Driver.	Modulator Unit Chassis Screw				1 P194-A138	0821	H103 H104	2	1	0	2	2

TABLE 8-4 COMBINED PARTS AND SPARE PARTS LIST

PARTS										SPARE PARTS			
										EQUIP.		STOCK	
SYMBOL DESIG.	NAME OF PART AND DESCRIPTION	FUNCTION	AWS-JAN OR NAVY TYPE DESIG.	NAVY STOCK NO	ARMY STOCK NO	MFR'S AND MFR'S DESIG.	CONTR'S DWG OR PART NO	ALL SYMBOL DESIG INVOLVED	TOTAL QTY USED ON EQUIP	ON EQUIP	NEXT	ON EQUIP	NEXT
	MODULATOR SECTION OF TRANSMITTER												
P101	Plug, Polarized 8 prongs (1/4" wide x 1/16") 110 volts 10 amperes. Moulded Bakelite Insulation. Fibre lined metal cap with cable grip clamp. OA Dimensions including prongs and Cable Clamp 1-5/16" long, 1-1/8" wide, 3-3/16" high.	Input and Output				69 P408CCT	1620	P101	1	1	1	2	2
R101	Resistor; Fixed Carbon 240,000 ohm ± 10% 1 watt .225 Diam., .562 long, .041 Axial Leads 1-1/2" long.	Hi-Lo Pulse Rate	RC30AF 244K			48 GB2441	1894	R101	1	1	1	2	4
R102	Potentiometer W.W. 0-75000 ohm 8 watt 1/4" shaft with slot and Lock, 3/8-32 Mounting Stud. OA Dimensions 2" diam. 1-1/2" long INC lugs Three Soldering Lug Terminals.	Hi-Lo Pulse Rate Control	RA30A1 SD753K			190 PWW5	1895	R102	1	1	1	2	4
R103	Potentiometer W.W. 0-30000-Ohm 8 watt 1/4" shaft with slot and lock 3/8-32 Mounting stud. OA Dimensions 2" diam. 1-1/2" long Inc. Lugs, three soldering lug terminals.	Low Rate Pulse Control	RA30A1 SD303K			190 PWW5	1896	R103	1	1	1	2	4
R104	Resistors; Fixed Carbon 330,000-ohm ± 5% - 2 watt. .312 Diam. .688 long .046 Axial leads 1-1/2 long.	6L6GA Dropping Resistor	RC40AF 334J			48 HB3345	1897	R104	1	1	1	2	4

R105	Resistor; Fixed Carbon, 22000-ohm ± 10% - 1 watt .225 Diam. 562 long .041 Axial Leads 1-1/2" long.	829B Cathode Bias	RC30AF 223K			48 GB2231	1893	R105	1	1	1	1
R106	Resistor; Fixed Carbon 47 ohm ± 10% 1 watt .225 Diam. .562 long .041 Axial Leads 1-1/2" long.	829B Grid Parasitic Suppressor	RC30AF 470K			48 GB4701	1893	R106 R107 R108 R109	4	1	2	10
R107	Same as R106.	829B Plate Parasitic Suppressor										
R108	Same as R106.	829B Plate Parasitic Suppressor										
R109	Same as R106.	829B Grid Parasitic Suppressor										

TABLE 8-4 COMBINED PARTS AND SPARE PARTS LIST

PARTS										SPARE PARTS			
										EQUIP.		STOCK	
SYMBOL DESIG.	NAME OF PART AND DESCRIPTION	FUNCTION	AWS-JAN OR NAVY TYPE DESIG.	NAVY STOCK NO	ARMY STOCK NO.	MFR'S AND MFR'S DESIG	CONTR'S DWG OR PART NO	ALL SYMBOL DESIG. INVOLVED	TOTAL NO. PER EQUIP.	BOX NO	QUAN.	BOX NO	QUAN.
	MODULATOR SECTION OF TRANSMITTER												
T101	Transformer; Pulse, 1500 volts, 60 cycle test voltage, pulse voltage (Max) 1500, core area .0852 sq. in. term 1 & 2 -140 turns #38 wire, 12.5 ohms Resis. at 25° C. term 3-4--140 turns #38 wire 12.2 ohms DC resis. term 5-6-70 turns #32 wire 1.72-ohms, term 7-8-140 turns #32 wire 13.8 ohms. Polarity terms 1, 4-5-8 Positive terms 2,3,6,7 negative, can size 2" Diam. 2-1/4" high. 8 soldering lug term. extend 5/8" from can.	61/6GA Pulse Trans				52 4P35	2023	T101 T102	2	1	1	2	6
T102	Same as T101.	329B Pulse Trans											
T103	Transformer, Filament; primary 115 volt 60 cycle, #26 wire. Secondary 6.3 volt, 5 amps, 2- #18 wire can size 2-15/16 long, 2-9/16 wide, 4-3/8" high, 4 Soldering lug terminals extend 13-16" from top of can, four 10-32 Mounting studs 19/32" long, 2" centers.	Filament Trans.				11 12(29)	2024	T103	1	1	1	2	3
V101	Tube JAN 61/6GA.	Pulser	JAN 61/6GA			45 61/6GA	2222	V101	1	1	2	2	0

| | | |

TABLE 8-4 COMBINED PARTS AND SPARE PARTS LIST

PARTS										SPARE PARTS			
										EQUIP.		STOCK	
SYMBOL DESIG.	NAME OF PART AND DESCRIPTION	FUNCTION	AWS-JAN OR NAVY TYPE DESIG.	NAVY STOCK NO.	ARMY STOCK NO.	MFR'S AND MFR'S DESIG.	CONTR'S DWG OR PART NO.	ALL SYMBOL DESIG. INVOLVED	TOTAL NO. PER EQUIP.	BOX NO	QUAN.	BOX NO.	QUAN.
	FRONT PANEL												
C201	Capacitor; Fixed paper oil impregnated .5 Mfd ± 10% 600 V.D.C. working metal case 1-3/4" long, 1" wide, 1" high. 3/16" Diam. Mounting Holes 2-1/8" centers. Soldering Lug Terminals (Side).	Motor By Pass	CP50B1 EF504K			6 630	0351	C201	1	1	1	2	3
F201	Fuse; Bakelite enclosed 5 Amps 115 volts. OA Dimensions 9/32" Diam. 1-1/4" Long.	Line Fuse				114 414005	065	F201 F202 F203	3	1	30	2	150
F202	Same as F201.	Line Fuse											
F203	Same as F201.	Spare											
H201	Captive Screw; Front panel; Stainless Steel, OA Length 4-1/32". 3/32" Max Diam. Tapered Pilot 3/32" long. 5/16-18 thread 5/8" long. Plain shank .218 Diam. 2-7/8" long collar at head 1/2" Diam. 3/32" Long Head 3/4" Diam. 11/32" long slotted and knurled.	Panel to Case				1 P194-A170	0822	H201 H202 H203 H204	4	1	0	2	4
H202	Same as H101.	Panel to Case											

H203	Same as H101.	Panel to Case										
H204	Same as H101.	Panel to Case										
I201	Pilot Lamp; .25 Amp 6-8 Volt Bayonet Base.	Power Pilot	TB11			88 44	091	I201	1	1	2	2	6
J201	Receptacle, Female 8 Phosphor Bronze Knife Switch contacts 110 Volts 10 AMPS. Angle Mounting Brackets .169 Mounting Holes 2-1/2" centers. Soldering Lug terminals. OA Dimensions 2-15/16" Long, 1-3/16" wide, 1-1/4" high.	Modulator Connector				69 S408AB	1031	J201	1	1	1	2	2
J202	Receptacle; Female 6 Phosphor Bronze Knife switch contacts 110 volts 10 AMPS Angle Mounting Brackets .169 Mounting Holes 2-1/16" centers. Soldering Lug Terminals OA Dimensions 2-1/2" Long, 1-3/16" wide, 1-1/4" high.	Oscillator Connector				69 S406AB	1032	J202	1	1	1	2	2
J203	Connector; Box Mtg. Type 1-13/16" Diam. 1-9/16" long, with Mounting Bracket 2" Square, 3/32" thick, 13/16" from plug end. Four .147 Diam. Holes 1-7/16" centers each side 1-3/4-18 Coupling thread. 6 #16 Contacts 4 #12 Contacts.	Power Supply Connector	AN-3102 28-19S			187 AN-3102 29-19S	1033	J203	1	1	1	2	2
J204	Connector; Box Mtg. Type 1-7/16" Diam. 1-9/16" long with Mounting Bracket 1-5/8" Square 3/32" thick 3/4" from plug end. Four .120 Diam. Holes 1-1/4" C-C each side 1-3/8-18 Coupling thread 2 #12 contacts 2 #8 contacts.	Power Supply Line Connector	AN-3102 22-4P			187 P063-7	1034	J204	1	1	1	2	2

TABLE 8-4 COMBINED PARTS AND SPARE PARTS LIST

PARTS										SPARE PARTS			
										EQUIP.		STOCK	
SYMBOL DESIG.	NAME OF PART AND DESCRIPTION	FUNCTION	AWS-JAN OR NAVY TYPE DESIG.	NAVY STOCK NO.	ARMY STOCK NO.	MFR'S AND MFR'S DESIG.	CONTR'S DWG OR PART NO.	ALL SYMBOL DESIG. INVOLVED	TOTAL NO. PER EQUIP.	BOX NO.	QUAN.	BOX NO.	QUAN.
	FRONT PANEL												
J205	Jack, Male, thread size 5/8-24, shell and set screw. 1" square Mounting Plate with Mounting Holes 3/4" CC. Approx. OA Dimensions 1-13/16" Long x 1" x 1". Female Pin .120 Diam. 11/16" long, Modified by Enlarging Mounting Holes and installing 4-40 clinch nuts.	Antenna Output	-UG13/U			59 118083	1036	J205	1	1	1	2	2
J206	Pilot Light Assembly; Mechanical Dimmer includes red jewel and cap. reducer bushing and locknut light socket & bracket OA Dimensions 2-3/8" long, 1" Diam.	Hold Pilot Lamp I201				217 431	105	J206	1	1	1	2	1
J207	Fuse Holder; Moulded Phenolic, Finger operated knob, For 3 AG Fuse OA Dimensions 2-7/32" long, 23/32" Diam.-Cap Drilled for test Prod.	Hold F201				114 342001	1035	J207 J208 J209	3	1	1	2	3
J208	Same as J207.	Hold F202											
J209	Same as J207.	Hold F203											

M201	Microammeter, D.C. single scale, Range C-100 Microamperes D.C. 2-3/4" Diam. Flush Bakelite case 1-5/8" behind flange plus 11/16" x 1/4-32 Mounting studs.	Monitor Wave Meter R.F. Indicator	MR34" 100 DCUA			52 NX35	131	M201	1	1	0	2	2
0-201	Counter; tenth revolution four figures, shaft right top coming Mounting holes tapped 4-40-1.065 centers, overall Dimensions including shaft 1-3/8" long, 1-3/8" wide, 7/8" high.	Plate Counter				63 Series 1141 To Dwg. P194-A-74	159	0-201 0-202	2	1	0	2	2
0-202	Same as 0-201.	Cathode Counter											
R201	Resistor, fixed wire wound 7.5 ohm ± 5%, 1/2 watt, 3/16" Diam. 5/8" long Axial leads.	M301 Shunt				8 BW 1/2	1898	R201	1	1	1	2	4
S201	Switch; toggle single pole, single throw, 3 Amps at 125 volts, bat handle moulded Phenolic case 7/16" Mounting stud.	Recognition Hi-Low Switch	St-16-A			116 82301	197	S201 S202 S203	3	1	1	2	3
S202	Same as S201.	Monitor Wave Meter Switch											
S203	Same as S201.	Modulator Switch											
S204	Switch, Toggle, Double Pole, single throw 3 AMPS at 125 volts, Bat handle, Moulded Phenolic Case 7/16" Mounting Stud.	Power Switch	ST-26-K			116 82304	199	S204	1	1	1	2	1

TABLE 8-4 COMBINED PARTS AND SPARE PARTS LIST

PARTS										SPARE PARTS			
										EQUIP.		STOCK	
SYMBOL DESIG.	NAME OF PART AND DESCRIPTION	FUNCTION	AWS-JAN OR NAVY TYPE DESIG.	NAVY STOCK NO.	ARMY STOCK NO.	MFR'S AND MFR'S DESIG.	CONTR'S DWG OR PART NO.	ALL SYMBOL DESIG. INVOLVED	TOTAL NO. PER EQUIP.	BOX NO	QUAN.	BOX NO.	QUAN.
	OSCILLATOR SECTION OF TRANSMITTER												
C401	Capacitor, Silver mica, button type 200 MMF ± 10% 500 V.D.C. Working; .447" Diam. 1/16" thick, L type feed thru terminals three Mounting tabs; OA Dimensions .447 Diam. 5/8" diam.	Cathode RF By Pass For V401				9 370-CB	0352	C401 C402	2	1	1	2	2
C402	Same as C401.	Fila-ment RF By Pass											
E401	Contact, Tube Grid; generally disc. shaped with inside slotted fingers. Beryllium copper, fastens to cath-ode cavity, Resonator outer assem-bly with machine screws. Overall Dimensions approx. 1-9/16" Diam. 3/32" thick.	Grid Contact V401				1 P194-A27	0561	E401	1	1	0	2	1
E402	Contact, tube cathode, generally disc. shaped with inside slotted fingers, beryllium copper, fastens to cathode cavity. Resonator inner assem. with machine screws overall Dimensions approx. 1-5/8" Diam. 3/64" thick.	Cathode Contact V401				1 P194-A24	0562	E402	1	1	0	2	1

E403	Contact, Tube Plates generally cylindrical in shape with longitudinally slotted fingers, beryllium copper, fastens to plate inner conductor assembly with nut and lockwasher; approx. overall dimensions 1/2" diam. 21/32" long.	Plate Contact V401				1 P194-A12	0563	E403	1	1	0	2	1
E404	Contactor, Cathode; generally cylindrical in shape with longitudinally slotted fingers, beryllium copper, fastens to large cathode piston rods with machine screw approx. overall dimensions 2-1/2" diam., 1/2" long.	Grid to Cathode Contactor V401				1 P194-A1	0564	E404	1	1	0	2	2
E405	Contactor, plate; generally cylindrical in shape with longitudinally slotted fingers, beryllium copper, fastens to plate contactor piston rods with machine screws approx. overall dimensions 2-1/2" diam., 1/2" long with 1" Diam. center hole	Plate to Grid Contactor V401				1 P194-A2	0565	E405	1	1	0	2	2
E406	Contactor, Antenna Coupling and outer plate assembly generally cylindrical in shape with longitudinally slotted fingers and rectangular flange. Beryllium copper, fasten to antenna coupling base plate with machine screws approx. overall dimensions .875 x 1.813 x 2.313 long.	Antenna Coupling Output Conductor				1 P194-A256	0566	E406	1	1	0	2	2
H401	Wrench #4 for Allen Head Set Screw L Shaped .50 steel cad plated hex rod 1-3/4" long short arm 1/2" long.	Tool				210 #4	0827	H401	1	1	1	2	2

TABLE 8-4 COMBINED PARTS AND SPARE PARTS LIST

PARTS										SPARE PARTS			
										EQUIP.		STOCK	
SYMBOL DESIG.	NAME OF PART AND DESCRIPTION	FUNCTION	AWS-JAN OR NAVY TYPE DESIG.	NAVY STOCK NO.	ARMY STOCK NO.	MFR'S AND MFR'S DESIG.	CONTR'S DWG OR PART NO.	ALL SYMBOL DESIG. INVOLVED	TOTAL NO. PER EQUIP.	BOX NO	QUAN.	BOX NO.	QUAN.
	OSCILLATOR SECTION OF TRANSMITTER												
H402	Wrench #6 for Allen Head Set Screw L Shaped 1/16" steel cad plated hex rod 1-13/16" long. short arm 9/16" long.	Tool				210 #6	087	H402	1	1	1	2	2
H403	Wrench #8 for Allen Head Set Screw L Shaped 5/64 steel cad plated Hex. Rod 1-7/8" long. short arm 11/16" long.	Tool				210 #8	081	H403	1	1	1	2	2
H404	Wrench #10 For Allen Head Set Screw L Shaped 3/32" Steel cad plated hex rod 2-1/8" long short arm 3/4" long.	Tool				210 #10	082	H404	1	1	1	2	2
O-401	Cavity Resonator; cathode outer assem. generally cyclindrical in shape, brass tube silver plated fastens to plate cavity resonator with machine screws approx. over-all dimensions 4" diam., 5" long.	Outer Section Cathode Cavity				1 P194-B76	1510	O-401	1	1	0	2	2
O-402	Cavity Resonator; cathode inner assem. generally cylindrical in shape, brass tube silver plated fastens to cathode cavity resonator outer assembly with machine screws approx. overall dimensions 4" diam., 3" long.	Inner Section Cathode Cavity				1 P194-B213	1511	O-402	1	1	0	2	2

0-403	Cavity Resonator, plate, outer assem. generally cylindrical in shape, brass tube silver plated fastens to plate inner conductor. Assembly with machine screws. Approx. overall Dimensions 3-1/2" diam. x 5-1/2" long.	Outer Section Plate Cavity				1 P194-B77	1512	0-403	1	1	0	2	2
0-404	Plate inner conductor assembly; generally cylindrical in shape, brass tube silver plated, fastens to plate cavity resonator and mounting frame with machine screws. Approx. overall dimensions 3-1/2" diam. x 5-1/2" long.	Inner Section Plate Cavity B-Plus Conduc-tor				1 P194-C-36	1513	0-404	1	1	0	2	2
0-405	Gears, plate counter; pair Boston Gear Co. "G462 modified, Osc gear to Dwg. P194-A67 Counter Gear to Dwg. P194-A65 & P194-A66; 16 teeth .5 inch pitch diam., 32 pitch approx. 9/16" diam. x 3/8" long each.	Plate Counter Gears				1 P194-A65 P194-A66 P194-A67	1514	0-405	1	1	0	2	1
0-406	Gears, Cathode counter, pair Boston Gear Co. #G485 Modified drive gears to Dwg. P194-A68-P194-A69 36 teeth 1.5 pitch diam. 24 pitch. Approx. 1-1/2" diam. 9/16" long. Counter Gear to Dwg. P194-A70-P194-A71, 18 teeth, 1.5 pitch diam. 24 pitch approx. 25/32 diam. 9/16" long.	Cathode Counter Gears				1 P194-A68 P194-A69 P194-A70 P194-A71	1515	0-406	1	1	0	2	1
0-407	Rack; Antenna Coupling Steel Hard Chrome Plated 24 Pitch Boston Gear Works #L 505 Modified OA Dimensions 1-15/16" long, 1/4" wide, 1/4" thick.	Antenna Coupling Rack				1 P194-A-103	0828	0-407	1	1	0	2	1

TABLE 8-4 COMBINED PARTS AND SPARE PARTS LIST

PARTS										SPARE PARTS			
										EQUIP.		STOCK	
SYMBOL DESIG.	NAME OF PART AND DESCRIPTION	FUNCTION	AWS-JAN OR NAVY TYPE DESIG.	NAVY STOCK NO.	ARMY STOCK NO.	MFR'S AND MFR'S DESIG.	CONTR'S DWG OR PART NO.	ALL SYMBOL DESIG. INVOLVED	TOTAL NO. PER EQUIP.	BOX NO.	QUAN.	BOX NO.	QUAN.
	OSCILLATOR SECTION OF TRANSMITTER												
0-408	Gear Antenna Coupling Boston Gear Works #H2412 Modified Steel hard chrome plated 12 teeth .5 pitch diam. .24 pitch .190 hole .562 long.	Antenna Coupling Gear				1 P194-A-101	0829	0-408	1	1	0	2	1
0-409	Gear; Plate Counter Idler Boston Gear Works #H3232 Modified Steel Rhodium Plated 32 teeth 1" pitch diam. 32 pitch .385" long.	Plate Counter Idler Gear				1 P194-A57	0830	0-409	1	1	0	2	1
0-410	Gear; Plate Counter Shaft; Boston Gear Works #H3222 Modified Steel Rhodium Plated 22 teeth 11/16" Pitch diam. 32 pitch .190 hole 1/2" long.	Plate Counter Shaft Gear				1 P194-A 60	0831	0-410	1	1	0	2	1
0-411	Gear; Plate Counter Main Drive; Boston Gear Works #G178 Modified Brass Hard Chrome Plated 44 teeth 1-3/8" pitch Diam. 32 pitch hole tapped 11/32" 32 thread .305 long.	Plate Counter Main Drive Gear				1 P194-A229	0832	0-411	1	1	0	2	1
P401	Plug Male, polarized 6 prong (1/4" x 1/16") 10 amps 110 volt moulded bakelite insulation fibre lined metal cap with cable grip clamp. OA Dimensions 1-1/2" long, 1-1/8" wide, 2-9/16" high.	Oscillator Connector to Front Panel				69 P406-CCT	1621	P401	1	1	1	2	2

R401	Resistor; fixed wire wound 22-Ohm ± 5%, 1 watt, OA Dimensions 1/4" Diam. 1-1/4" long, Axial Leads.	Cathode Bias Resistor V401		8 BW1	1899	R401	1	1	1	2	4	
V401	Tube, RF Oscillator JAN 2C43.	RF Oscillator	JAN 2C43	88 JAN 2C43	2225	V401	1	1	2	2	0	
X401	Tube Socket; Mica Filled Bakelite 3 Contact, OA Dimensions, 1-1/8" Diameter 3/4" long.	Tube Socket V401		1 P194-A93	248	X401	1	1	1	2	1	
Y401	Crystal; Detector, .295 Diameter 7/8" long encased in lead shield.	Monitor Crystal	1N21B	3 1N21B	252	Y401 Y501	2	1	20	2	0	

TABLE 8-4 COMBINED PARTS AND SPARE PARTS LIST

PARTS										SPARE PARTS			
										EQUIP.		STOCK	
SYMBOL DESIG.	NAME OF PART AND DESCRIPTION	FUNCTION	AWS-JAN OR NAVY TYPE DESIG.	NAVY STOCK NO.	ARMY STOCK NO.	MFR'S AND MFR'S DESIG.	CONTR'S DWG OR PART NO.	ALL SYMBOL DESIG. INVOLVED	TOTAL NO. PER EQUIP.	BOX NO	QUAN.	BOX NO.	QUAN.
	WAVEMETER SECTION OF TRANSMITTER and MISCELLANEOUS												
0-501	Cavity Resonator; wavemeter assembly, generally cylindrical in shape, and including shaft contact with slotted fingers, cavity of bronze (centrifugalcasting), contact beryllium copper. Fastens to wave meter. Rear housing with machine screws: Approx OA Dimensions 2-1/8" diam., 3-3/16" long.	Wave Meter Cavity				1 P194-A130	1516	0-501	1	1	0	2	2
0-502	Universal Joint, Boston Gear Co. C-642-B Modified chrome plated 1/2" Diam. 1/4" base. Hub protection 23/32 overall length 2"	Wave Meter Shaft Coupling				1 P194-A252	1517	0-502	1	1	0	2	1
0-503	NOT USED.												
0-504	Gear, split worm & flange, wave meter shaft. Gear 24 pitch 34 teeth 1.417 pitch diam. .209 radius of curvature of throat. Flange has three .193 holes 120° apart for mounting wavemeter dial. Gear fastens to P194-B119 Wavemeter shaft worm gear bracket. OA Dimensions 1-5/8" diam. 1-7/32" long, 3/8" Diam. hole in center.	Wave Meter Worm Gear				1 P194-B111 P194-A118	1518	0-504	1	1	0	2	1

0-505	Gear, worm, Boston Gear Co. HLUH Modified 24 pitch single thread 1/2" pitch Diam. Face 11/16" hole 1/4", hub diam. .39 proj. 1/4" mates with gear 0-504.	Wave Meter Worm Gear				1 P194-A-112	1519	0-505	1	1	0	2	1
Y-501	Same as Y-401.	Crystal											
H601	Nut; Conduit coupling, 1-7/16-18 thread 1.278 opening OA Dimensions 19/16' Diam. 7/16' Thick.	Part of W601	AN3054 16			14 An3054-16	0823	H601 H602	2	1	2	2	4
H602	Same as H601.	Part of W601											
H603	Nut; Conduit Coupling 1-3/16-18 thread .993 opening OA Dimensions 1-5/16" diam. 7/16" thick.	Part of W602	An3054 12			14 AN-3054-12	0824	H603 H604	2	1	2	2	4
H604	Same as H603.	Part of W602											
H605	Ferrule; Flexible conduit; for 1" conduit. OA Dimensions 1.355 diam. 5/8" long.	Part of W601	AN3050-16			14 AN-3050-16	0825	H605 H606	2	1	2	2	4
H606	Same as H605.	Part of W601.											
H607	Ferrule; Flexible conduit for 3/4 ID conduit. OA Dimensions 1.105 Diameter 1/2" long.	Part of W602	AN3050 12			14 AN-3050-12	0826	H607 H608	2	1	2	2	4
H608	Same as H608.	Part of W602.					0827						

TABLE 8-4 COMBINED PARTS AND SPARE PARTS LIST

PARTS										SPARE PARTS			
										EQUIP.		STOCK	
SYMBOL DESIG.	NAME OF PART AND DESCRIPTION	FUNCTION	AWS-JAN OR NAVY TYPE DESIG.	NAVY STOCK NO.	ARMY STOCK NO.	MFR'S AND MFR'S DESIG.	CONTR'S DWG OR PART NO.	ALL SYMBOL DESIG. INVOLVED	TOTAL NO. PER EQUIP.	BOX NO.	QUAN.	BOX NO.	QUAN.
	MISCELLANEOUS												
H609	Shock Mount; Aircraft type, normal load rating 10 to 14 pounds, color coded green, 4- .234 Mounting Holes, .182, flat head pin 1-1/4" long. OA Dimensions 2-3/8" long, 2-3/8" wide, 1-5/8" high unloaded.	Shock Mount				62 M112-5	0810	H609 H610 H611 H612	4	1	0	2	8
H610	Same as H609.												
H611	Same as H609.												
H612	Same as H609.												
O-601	Adapter Brass Electro Tin Plated 1-3/4"-18 Male thread one End 1-7/16"-18 Female thread other end OA Dimensions 1.745 Diam. 1.125 long connects P601 and P605.	Part of W601				1 P194-A257	0828	O-601	1	1	1	2	2
O-602	Adaptor, Brass Electro Tin Plated 1-3/8"-18 Male thread one end 1-3/16"-18 Female thread other end. O.A. Dimensions 1.370 Diam., 1.188 long connects P603 and P606.	Part of W602				1 P194-A258	0829	O-602	1	1	1	2	2
P601	Connector Straight 10 contacts 4 #12 and 6 #16, male thread 1-7/16"-18 coupling ring female thread 1-3/4"-18. OA Dimensions 2-1/4" x 1-31/32".	Part of W601	AN-3106 28-19S			187 A3106 28-19S	1623	P601	1	1	1	2	2

| | | |

TABLE 8-4 COMBINED PARTS AND SPARE PARTS LIST

PARTS										SPARE PARTS			
										EQUIP.		STOCK	
SYMBOL DESIG.	NAME OF PART AND DESCRIPTION	FUNCTION	AWS-JAN OR NAVY TYPE DESIG.	NAVY STOCK NO.	ARMY STOCK NO.	MFR'S AND MFR'S DESIG.	CONTR'S DWG OR PART NO.	ALL SYMBOL DESIG. INVOLVED	TOTAL NO. PER EQUIP.	BOX NO	QUAN.	BOX NO.	QUAN.
	MISCELLANEOUS												
W602	Cable; Power Interconnecting; 4 terminal consists of American Phenolic Co. #9733-12 Flexible Aluminum Elec. Conduit approx. 0' 5-3/4" long H603-H607-0-602 P603 P606 one end H604-H608-P604 other end wired with 2-JAN C76-SR1R-4-(19)-14 wire.	#2 Power Inter-connect-ing Cable				1 P193-D209	2317	W602	1	1	1	2	2

TABLE 8-5. CROSS REFERENCE PARTS LIST

JAN (OR AWS) DESIGNATION	KEY SYMBOL	NAVY TYPE	KEY SYMBOL	NAVY TYPE	KEY SYMBOL
CM35C103J	C101		H402		P401
CP50B1EF104K	C102-C103		H403	AN-3106-28-19S	P601
CP50B1EF504K	C201		H403	AN-3108-28-19P	P602
UG-13/U	J205		H404	AN-3106-22-4P	P603
RC30AF244K	R101		H601-H602	AN-3108-22-4S	P604
RA30A1SD753K	R102		H603-H604	AN-3108-28	P605
RA30A1SD303K	R103		H605-H606	AN-3108-22	P606
RC40AF334J	R104		H607-H608		R201
RC40AF223K	R105		H609-H610-H611-H612		R401
RC30AF470K	R106-R107-R108-R109	TB11	I201		T101-T102
ST16A	S201-S202-S203		J201		T103
ST26K	S204		J202		W601
6L6GA	V101		J203		W602
829B	V102	AN3102-22-4P	J204		X101
2C43	V401		J206		X102
1N21B	Y401-Y501		J207-J208-J209		X401
NAVY TYPE	**KEY SYMBOL**		J210		
		MR34W100DCUA	M201		
	C401-C402		0201-0202		
	E101		0401		
	E102		0402		
	E103		0403		
	E401		0404		
	E402		0405		
	E403		0406		
	E404		0407		
	E405		0408		
	E406		0409		
	F201-F202		0410		
	F203-F204		0411		
	H101		0501		
	H102		0502		
	H103		0504		
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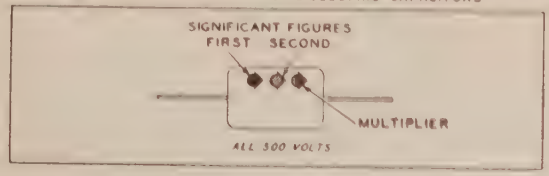
	H401		0601		
			0602		
			P101		

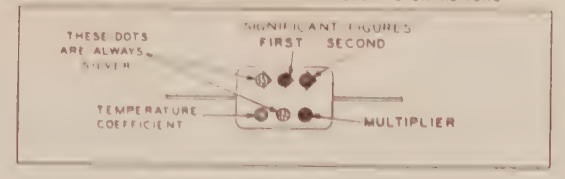
TABLE 8–6. APPLICABLE COLOR CODES AND MISCELLANEOUS DATA

CAPACITOR COLOR CODES

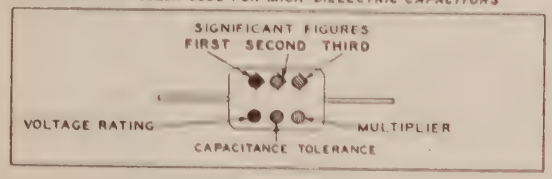
RMA 3-DOT COLOR CODE FOR MICA-DIELECTRIC CAPACITORS



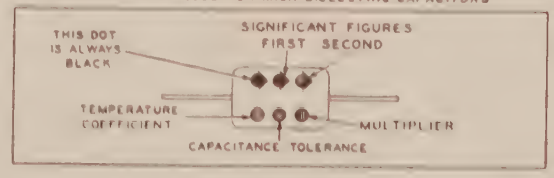
JAN 6-DOT COLOR CODE FOR PAPER-DIELECTRIC CAPACITORS



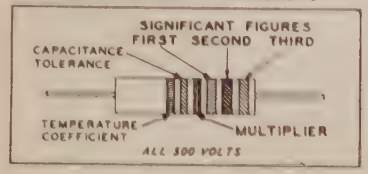
RMA 6-DOT COLOR CODE FOR MICA-DIELECTRIC CAPACITORS



JAN 6-DOT COLOR CODE FOR MICA-DIELECTRIC CAPACITORS

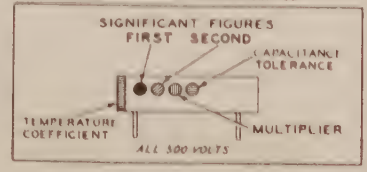


RMA COLOR CODE FOR TUBULAR CERAMIC-DIELECTRIC CAPACITORS

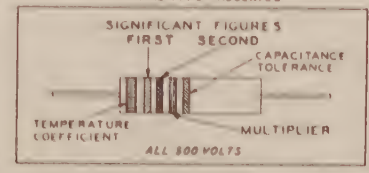


JAN COLOR CODE FOR FIXED CERAMIC-DIELECTRIC CAPACITORS

RADIAL TYPE NON-INSULATED



AXIAL TYPE INSULATED



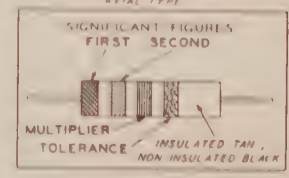
RMA: RADIO MANUFACTURERS ASSOCIATION
JAN: JOINT ARMY-NAVY

RESISTORS				CAPACITORS				
				MULTIPLIER				
TOLERANCE	MULTIPLIER	SIGNIFICANT FIGURE	COLOR	RMA MICA AND CERAMIC-DIELECTRIC	JAN MICA AND PAPER-DIELECTRIC	JAN CERAMIC DIELECTRIC	VOLTAGE RATING	TEMPERATURE COEFFICIENT
	1	0	BLACK	1	1	1		A
	10	1	BROWN	10	10	10	100	B
	100	2	RED	100	100	100	200	C
	1000	3	ORANGE	1000	1000	1000	300	D
	10000	4	YELLOW	10000			400	E
	100000	5	GREEN	100000			500	F
	1000000	6	BLUE	1000000			600	G
	10000000	7	VIOLET	10000000			700	
	100000000	8	GRAY	100000000		0.01	800	
	1000000000	9	WHITE	1000000000		0.1	900	
5	0.1		GOLD	0.1	0.1		1000	
10	0.01		SILVER	0.01	0.01		2000	
20			NO COLOR				500	

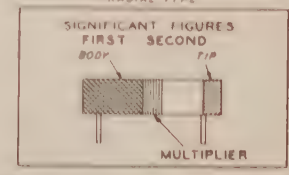
RESISTOR COLOR CODES

RMA COLOR CODE FOR FIXED COMPOSITION RESISTORS

AXIAL TYPE

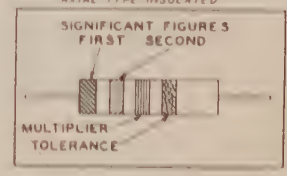


RADIAL TYPE



JAN COLOR CODE FOR FIXED COMPOSITION RESISTORS

AXIAL TYPE INSULATED



RADIAL TYPE NON-INSULATED

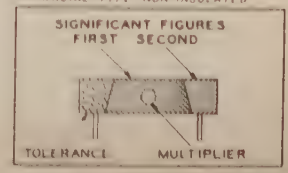


TABLE 8-7. LIST OF MANUFACTURERS

CODE NO.	MFGR. PREFIX	NAME	ADDRESS	
1	CGZ	General Communication Co.	681 Beacon St.	Boston, Mass.
3	CHS	Sylvania Electric Products Co.	500 Fifth Ave.	New York, N. Y.
6	CAM	Aerovox Corporation	740 Belleville Ave.	New Bedford, Mass.
8	CIR	International Resistance Corp.	401 No. Broad Ave.	Philadelphia, Pa.
9	CER	Erie Resistor Corporation	644 W. 12th St.	Erie, Pa.
11	CFX	Freed Transformer Co.	72 Spring St.	New York, N. Y.
12	CDB	Bud Radio Inc.	5205 Cedar Ave.	Cleveland, Ohio
14	CPH	American Phenolic Company	1830 So. 54th Ave.	Chicago, Ill.
41	CKR	G. E. Co. Ken-Rad. Tube Division		Owensboro, Ky.
45		Bureau of Ships Navy Department		
48	CBZ	Allen Bradley Company	118 W. Greenfield Ave.	Milwaukee, Wis.
52	CAY	Westinghouse Electric Co.	2519 Wilkins Ave.	Baltimore, Md.
59	CUF	Ucinite Company	1 Nevada St.	Newtonville, Mass.
62	CAYU	L. N. Barry Company	489 Main St.	Cambridge, Mass.
63	CASV	Veeder Root Company	25 Sargent St.	Hartford, Connecticut
69	CJC	Howard B. Jones Company	2500 W. Wabansia Ave.	Chicago, Ill.
88	CG	General Electric Company		Schenectady, N. Y.
102	CBH	Boston Gear Works	10 Hayward St.	No. Quincy, Mass.
114	CLF	Littlefuse Laboratories Inc.	4765 Ravenswood Ave.	Chicago, Ill.
116	CHH	Arrow Hart & Hegeman	103 Hawthorne St.	Hartford, Conn.
187	CED	Cannon Electric Development Co.	3291 Humbolt St.	Los Angeles, Cal.
190	CATS	Trefz Mfg. Co.	3811 Main St.	Flushing, N. Y.
210	CAYT	Allen Mfg. Co.		Hartford, Conn.
217	CEJ	E. F. Johnson		Waseca, Ill.
220	CGM	New Departure Div. General Motors		Bristol, Conn.

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